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NUTRITIONAL IRON-DEFICIENCY ANAEMIA

With Special Reference to Prevalence and Age and Sex Incidence

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During the past four years a large-scale investigation into the aetiology and treatment of iron-deficiency anaemias has been carried out by a team of workers in Aberdeen. A preliminary report was published in the *Journal* in 1933,[1] in which it was shown that anaemia occurred very frequently in adult women belonging to the poorest classes in Aberdeen. Further, it was demonstrated that the anaemia was due to an iron deficiency, in the production of which several factors played a part. Since 1933 our survey has been continued and extended to include a large number of individuals of both sexes and of all ages. In the present communication we propose to confine our attention to the incidence of anaemia in relation to age and sex, and to consider in a subsequent report the aetiological effects of menstruation, pregnancy, lactation, diet, infections, and achlorhydria. The observations to be reported were made on approximately 3,500 individuals, some of whom were examined on several occasions. This number includes the 1,250 men, women, and children who formed the subject of the previous communication.

The individuals concerned represent a cross-section of the poorest classes of the population in Aberdeen and the North-East of Scotland. The subjects had not presented themselves for medical examination because of any symptoms of ill-health, but were volunteers obtained at ante-natal, mother, and child welfare clinics and dispensaries, or at schools and clubs. A large proportion of the individuals were members of families in which the wage-earner was unemployed. Previous investigations[1 2] in this class of the community showed that the iron content of the diet was frequently well below the optimal figure of 15 to 20 mg. daily, since it averaged about 10 mg. An iron intake of between 5 and 8 mg. per day was not an uncommon finding. The haemoglobin was estimated by the Haldane haemoglobinometer (where 100 per cent. is the equivalent of 13.8 grams of haemoglobin per 100 c.cm. of blood). The instruments were checked at regular intervals against a tube standardized by Dr. C. Price-Jones.

Standards Adopted

In order to estimate the incidence of anaemia it is necessary to consider the normal standards for the groups under review. From the figures given in the literature it is difficult to arrive at satisfactory conclusions. The main reasons for this are the diversity of methods used for the estimation of haemoglobin in the blood, and the apparent differences in the haemoglobin levels of normal individuals in various countries. Thus Williamson,[3] examining 919 individuals in America by the spectrophotometric method, found an average value of 16.92 grams haemoglobin per 100 c.cm. of blood for normal adult males, and 15.55 grams for adult females. Conversion of these figures to the Haldane scale gives haemoglobin values of 122.6 per cent. for males, and 112.7 per cent. for females. Similar findings have been reported by Wintrobe,[4] using the Newcomer haemoglobinometer. These figures are much higher than the mean values for adult males and females in this country published by Price-Jones,[5] though in agreement with the results of Jenkins and Don.[6] Our own experience is in keeping with the former, and accordingly we prefer to accept the Price-Jones standards of normality. A review of the literature afforded little help in regard to the normal haemoglobin concentration in children and adolescents. Of twenty-five children of the better classes between the ages of 1 and 5 years, observed by Spence,[8] twenty had haemoglobin concentrations between 75 and 84 per cent. on the Sahli-Leitz scale, or between 85 and 95 per cent. on the Haldane scale.

We have decided to adopt the following normal standards:

1. Infants over 5 months of age, 86 per cent. This was the average figure obtained by Helen Mackay[7] for breast-fed infants after iron treatment, and may therefore be considered to represent the haemoglobin level in the absence of iron deficiency.

2. Children aged 2 to 5 years, 90 per cent.

3. School children, 95 per cent.; adolescent females, 95 per cent.; and adolescent males, 105 per cent. These standards are based on our observations, which show that about 50 per cent. of individuals belonging to the poorest classes attain these levels.

4. Adult males, 105 per cent.; adult females, 98 per cent., in accordance with the standards established by Price-Jones.[5]

These standards represent, of course, only the average findings in normal individuals; the range of normality extends 10 per cent. above and below. Anaemia cannot be said to be present unless the haemoglobin level is below the lower limit of the normal range.

For convenience the terms "moderate anaemia" and "severe anaemia" are referred to in the text. In infants between 5 and 23 months "moderate anaemia" is taken to represent the haemoglobin range 60 to 74 per cent., and "severe anaemia" all values below 60 per cent. For adults and adolescents of both sexes "moderate anaemia" denotes a haemoglobin level of 70 to 79 per cent., and "severe anaemia" values below 70 per cent.

Results Obtained

The results of the haemoglobin estimations are summarized in Tables I to V, and plotted in the chart. Below the age of 12 years no distinction is made between the sexes. In the tables the number of individuals examined at each age is shown in the column headed "Number." The haemoglobin values in each age group are arranged in decimal divisions. To facilitate comparison the number of individuals falling within each decimal range is expressed as a percentage of the total number in each group, and is shown in the columns under "Haemoglobin Range." In addition to showing the percentage incidence of the haemoglobin levels, the tables give the average haemoglobin concentration for each group. These are presented in the last column of each table, and have been used in the construction of the chart.

INFANTS

TABLE I.—*507 Infants: 1 to 23 Months*

Age (Months)	Number	Haemoglobin Range								Average Hb
		40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	
1	12	0	0	0	42	8	8	25	17	90.8
2	50	0	4	18	36	28	12	2	0	77.6
3	49	2	2	16	39	27	12	2	0	77.1
4	62	2	0	10	34	33	19	2	0	80.5
5	50	0	0	10	35	18	2	4	0	79.8
6	61	0	3	15	46	31	5	0	0	77.9
7	48	2	2	4	52	35	4	0	0	77.4
8	37	0	0	8	43	43	5	0	0	78.5
9	44	0	9	7	41	36	7	0	0	77.3
10	28	0	7	14	36	33	4	0	0	75.8
11	16	6	25	19	31	19	0	0	0	68.0
12-17	33	6	12	15	42	12	12	0	0	72.3
18-23	17	0	12	35	41	6	6	0	0	71.5

Table I shows the results obtained in 507 infants aged from 1 to 23 months. In addition, haemoglobin estimations were made on sixty-six infants within twenty-four hours of birth, and on fifty-six infants on the eighth day of life. At birth the haemoglobin levels varied from 103 to 189 per cent., the average being 144.9 per cent. Physiological haemolysis produced a rapid fall to an average value of 132.7 per cent. for infants 8 days old, and 90.8 per cent. for infants between 1 and 2 months. A further fall to 77.6 per cent. occurred in the following month. Thereafter no marked change was noted till the eleventh month, when the effect of iron deficiency became evident in a rapid decline to 68 per cent. Despite the commencement of a mixed dietary at the age of about 9 months, no significant alteration in the haemoglobin concentration was found by the end of the second year of life, and the incidence of anaemia was high throughout this period. Eighty-three per cent. of our infants between the ages of 5 and 23 months fell below the average figure for normal infants (Hb 86 per cent.); 41 per cent. were anaemic (Hb less than 76 per cent.); 29 per cent. were moderately anaemic (Hb 60 to 74 per cent.); and 7 per cent. severely anaemic (Hb less than 60 per cent.).

PRE-SCHOOL CHILDREN

TABLE II.—*58 Children: 2 to 5 Years*

Age (Years)	Number	Haemoglobin Range							Average Hb
		40-49	50-59	60-69	70-79	80-89	90-99	100-109	
2	19	5	11	11	32	42	0	0	73.0
3	16	0	0	12	19	56	12	0	79.4
4	9	0	0	0	33	44	12	12	83.1
5	14	0	0	0	7	64	29	0	86.0

Table II gives haemoglobin estimations on fifty-eight children. Thirty-two per cent. were found to be anaemic (Hb below 80 per cent.). As the child approached the school age the incidence of anaemia became less, and the average haemoglobin rose steadily to reach the level of 86 per cent. at the fifth year. Spence[5] reports that of 121 children from labouring and artisan families in Newcastle-upon-Tyne 19.8 per cent. had satisfactory haemoglobin values, and 23.1 per cent. were definitely anaemic. For comparison we have converted the standards on the Sahli scale utilized in his assessment to the Haldane scale, and find that of the fifty-eight children examined by us approximately 39 per cent. had satisfactory haemoglobin levels (above 85 per cent.), while 17 per cent. were anaemic (below 73 per cent.). We may conclude, therefore, that a state of anaemia occurs in the industrial areas of England like that in Aberdeen.

OLDER CHILDREN

TABLE III.—*44 Children: 6 to 11 Years*

Age (Years)	Number	Haemoglobin Range				Average Hb
		70-79	80-89	90-99	100-109	
6	8	0	75	25	0	87.4
7	12	0	35	58	17	90.2
8	7	0	71	29	0	88.0
9	8	0	38	50	12	91.4
10	4	0	25	50	25	92.0
11	5	0	20	60	20	95.0

An average haemoglobin content of 90 per cent. was found in the forty-four subjects of this group. No child was observed to have a concentration less than 80 per cent. In addition to the figures presented in Table III, we have data regarding 750 school children who were not included in the chart because their exact ages were not noted. Careful clinical examination on two occasions of 650 children showed that only 1 per cent. were mildly anaemic. The rarity of anaemia in school children was further confirmed by haemoglobin estimations on the remaining 100, only two of whom showed a mild anaemia (Hb 70 to 84 per cent.). While it is probable that children of the upper classes have higher haemoglobin levels, it is obvious that nutritional anaemia is of little importance in this group.

ADOLESCENTS

TABLE IV.—*320 Adolescents: 12 to 18 Years*

Sex	Number	Haemoglobin Range						Average Hb
		60-69	70-79	80-89	90-99	100-109	110-119	
Male ...	74	0	0	13	41	42	4	98.8
Female ...	246	1	5	33	40	19	2	91.7

Table IV shows the results obtained in 320 adolescents between the ages of 12 and 18 years. The average haemoglobin level of the seventy-four males is 98.8 per cent. The haemoglobin value was below 90 per cent. only in ten individuals, and no figure below 85 per cent. was obtained. Anaemia appears to be rare and slight in degree among adolescent males. For the 246 adolescent girls the average haemoglobin was 91.7 per cent. Sixteen per cent. fell below 85 per cent. haemoglobin, but only 5 per cent. were moderately anaemic (Hb 70 to 79 per cent.) and 1 per cent. severely anaemic (Hb less than 70 per cent.). The importance of this finding is emphasized by the fact that most of these girls belonged to a club used by the poorest classes in this city. If chlorosis exists to any degree at the present day it should be found in this group, and the rarity of anaemia in these 246 adolescent girls proves that chlorosis of the severe type common thirty years ago has practically disappeared. An incidence of anaemia amounting to 16 per cent. among these girls does, however, contrast with the absence of anaemia in males, and suggests that an iron deficiency of mild degree is liable to occur in adolescent girls of the poorest class.

Table V sets forth the results obtained in 1,677 adults.

(*a*) *Males.*—Ninety-three males, ranging in age from 19 to 69 years, were examined. The average haemoglobin was 97 per cent. Only four subjects had haemoglobin levels below 80 per cent., and all of these were found to be suffering from severe organic disease. Although this average level is 8 per cent. less than that established by Price-Jones for normal males of the better class, it is apparent that in the absence of organic disease an iron-deficiency anaemia does not occur in males.

ADULTS

TABLE V.—*1,677 Adults*

	Ages	Number	Haemoglobin Range									Aver. Hb
			20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-109	110-119	
(*a*) Males...	9-69	93	0	0	2	0	1	1	11	33	42	10	97.0
(*b*) Nulliparae	18-29	50	0	0	0	4	2	10	20	50	14	0	89.7
(*c*) Parous women ...	15-44	603	1	2	3	4	6	17	31	31	5	0	81.3
(*d*) Parous women ...	45+	112	0	0	3	3	4	9	34	31	15	2	86.7
(*e*) Pregnant women...	15-44	819	0	0.5	1	4	2	32	3	12	0.5	0	78.1

(*b*) *Nulliparae* (18 to 29 years).—The fifty women of this group had an average haemoglobin concentration of 89.7 per cent. Twenty-five per cent. were anaemic (Hb less

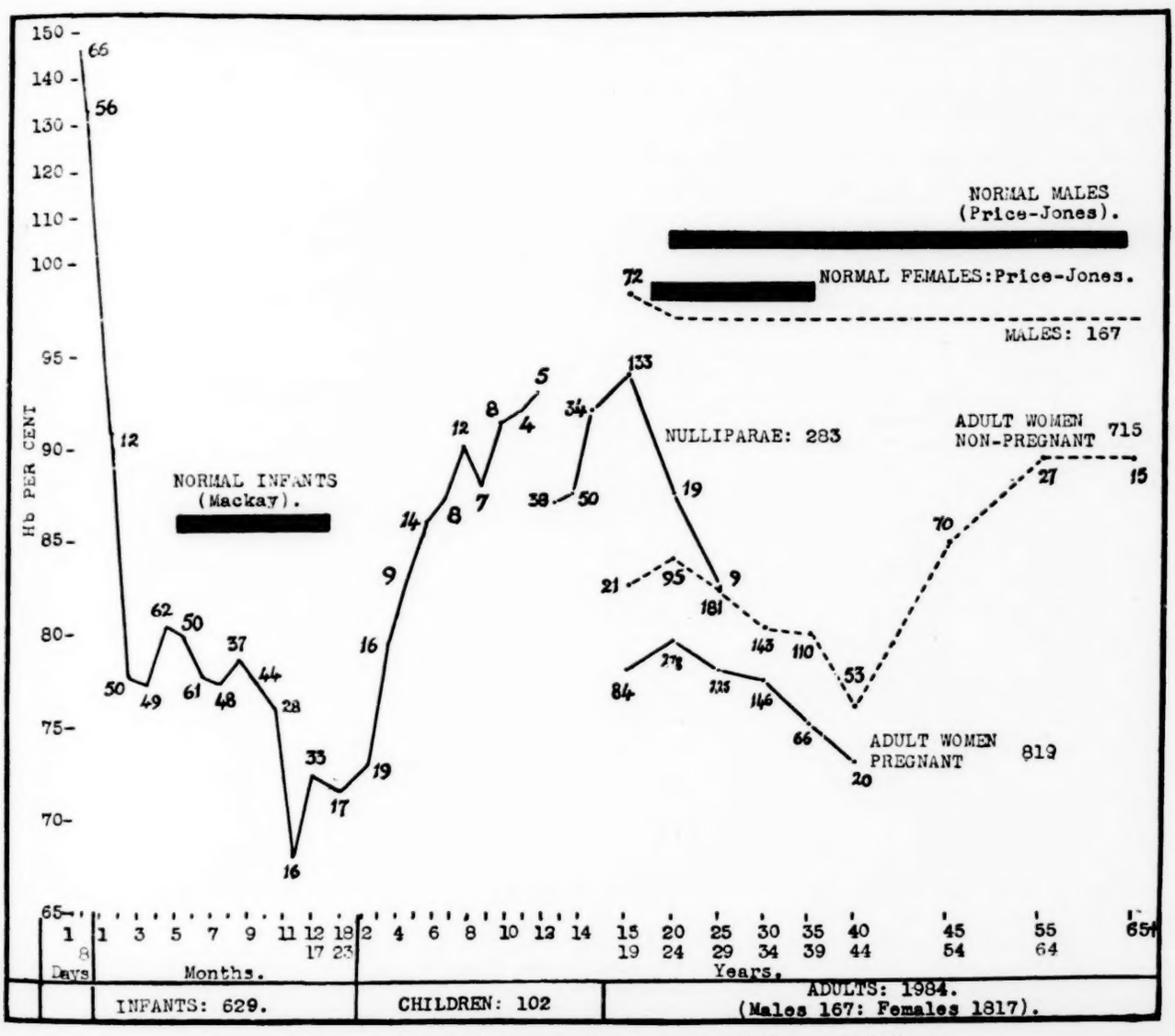

Chart showing average haemoglobin level among poor persons of all ages and both sexes.

than 85 per cent.) ; 10 per cent. showed a moderate anaemia (Hb 70 to 79 per cent.) ; and 6 per cent. a severe anaemia (Hb below 70 per cent.). Reference to the chart indicates that the curve for nulliparae falls abruptly from a level of 95.4 per cent. haemoglobin at 18 years to 83 per cent. haemoglobin as the average value for the age group 25 to 29 years. These findings suggest that an iron-deficiency anaemia may arise in nulliparous females of this social class with advancing age, but the small figures available in the older age groups do not warrant a definite conclusion.

(*c*) *Parous Women* (15 to 44 years).—Haemoglobin estimations were made on 603 non-pregnant women who had borne children. At least two months had elapsed between examination and the termination of the last pregnancy. Eighty-eight per cent. of this group fell below the standard (98 per cent.) established by Price-Jones for normal women ; 17 per cent. showed a moderate anaemia, and 16 per cent. a severe anaemia. Taking 85 per cent. haemoglobin as the lower limit of the normal range for women, 48 per cent. of these women were below this level. Thus a high incidence of anaemia is found in this group. Reference to the chart shows that the average haemoglobin level falls steadily as the age increases.

(*d*) *Parous Women* (45 years and over).—Haemoglobin estimations of 112 non-pregnant women of 45 years of age and over who had borne children yielded an average level of 86.7 per cent. Nine per cent. showed a moderate anaemia, and 10 per cent. a severe anaemia. In all, 36 per cent. fell below 85 per cent. haemoglobin. It is seen that in this older group of women the average haemoglobin level was higher, and the incidence of anaemia less, than in the younger women. These findings are reflected in the rise of the average haemoglobin curve which occurs after the menopause (see chart).

(*e*) *Pregnant Women* (15 to 44 years).—Eight hundred and nineteen subjects are included in this group. The average haemoglobin percentage, irrespective of the month of gestation, was 78.1 per cent. for the entire group. Seventy per cent. were anaemic (Hb less than 85 per cent.) ; 32 per cent. were moderately anaemic ; and 17.5 per cent. severely anaemic. The average haemoglobin level was therefore lower, and the incidence of anaemia higher, than in non-pregnant women of the same age group. These slight differences can probably be explained by the physiological hydraemia which exists during pregnancy. The parallelism between the curves for pregnant and non-pregnant women is striking (see chart).

Discussion

From the figures given in the tables and from a study of the curve based on the average haemoglobin percentages, it is apparent that anaemia is relatively infrequent and of minor clinical importance except at two age periods—infants between the eleventh and twenty-third months of life, and adult women. The incidence of anaemia is highest in women of the reproductive age who have borne children, and is most marked in the latter part of this period. The same findings are obtained among pregnant women. After the menopause there is a lowering of the prevalence of anaemia.

It is a striking fact that anaemia is of such frequent occurrence in infants born of a group of women showing a high incidence of anaemia. We would suggest that this can be explained only as a result of some aetiological factor common to both groups. The influence of age and sex in the production of the anaemia has been clearly demonstrated. The high incidence of anaemia in women, in contrast with its absence in men of the same social status, is striking, and justifies the conclusion that the physiological demands for iron conditioned by pregnancy and menstruation are not satisfactorily supplied by the diets of many women of the poorest classes. Hence the term " nutritional anaemia " would appear to be justified. A further two years' study of this problem has supplied no information which would induce us to alter our conclusions published in 1933—namely, that an iron-deficiency nutritional anaemia occurs with great frequency among women of the poorest classes, leading to loss of economic efficiency and ill-health ; and that this anaemia can be adequately and cheaply treated by the administration of iron salts.

Conclusions

1. Observations are reported on the haemoglobin levels of 3,500 individuals of both sexes and at all ages. Anaemia was found to be present in 41 per cent. of infants under 2 years, 32 per cent. of pre-school children, 2 per cent. of school children, 16 per cent. of adolescent women, and 45 per cent. of adult women. It was absent in adolescent and adult males, except in association with organic disease.

2. The influence of age and sex in the production of anaemia is demonstrated.

We wish to express our indebtedness to the directors and staff of the Aberdeen Maternity Hospital, the public health authorities, particularly Dr. J. A. Stephen, the director of education for the City of Aberdeen, and to the organizing secretaries of St. Katherine's Club, without whose co-operation this investigation would have been impossible.

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H. I. Schou (*Hospitalstidende*, May 21st, 1935) has counted the cases of neurasthenia, hysteria, and kindred nervous disorders treated in the Danish public hospitals during the past fifteen years, and finds that in this period there has been a rise of about 255 per cent., which, considering the increase of hospital accommodation and hospital treatment, cannot be accepted unreservedly as indicating that the neuroses are rapidly becoming more common. What the figures for the various hospitals do show is that an enormous number of patients suffering from neuroses require hospital treatment and get it, not in institutions specially organized and staffed for them, but in general surgical and medical hospitals, whose costly equipment and administration do not meet the patients' needs. The author gives an account of how Denmark is struggling to get out of this difficulty, and how, in 1928, the Dianalund Nerve Sanatorium was opened. An analysis of 2,500 patients treated in this institution, which according to its statutes is closed to the insane, showed that 50 per cent. of them were in fact insane. There were 20 per cent. suffering from functional neuroses. The remainder suffered either from organic disease of the nervous system or from medical ailments with a nervous element. Inquiries addressed to 300 patients, and answered by 215 of them three years after discharge, showed that more than half were fit for work. The author sees in his institution, notwithstanding its invasion by the definitely insane, the solution to a problem which in the past has meant that while practically every other well-defined disease has had appropriate institutions for its treatment, the victims of neuroses have had to be distributed indiscriminately in general hospitals.

THE THYROID GLAND AND HEART DISEASE *

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It has been known for many years that there is a close relation between abnormal thyroid function and heart disease, and, indeed, when exophthalmic goitre was first recognized it was thought to be a disease of the heart. In recent years there has been much investigation into the nature of this relation. The detection and treatment of the abnormal thyroid function underlying the cardiovascular abnormality is of fundamental importance, as a direct attack on the cardiac condition is usually ineffective. In the last few years evidence has also accumulated to show that artificial lowering of a previously normal thyroid function may be beneficial in cases of heart disease not associated with abnormal thyroid function. The subject-matter of this address therefore falls naturally into three portions—namely, (1) the heart in thyrotoxicosis ; (2) the heart in myxoedema ; and (3) the treatment by thyroidectomy of heart failure in patients without thyrotoxicosis.

THE HEART IN THYROTOXICOSIS

Increased activity of the thyroid gland such as occurs in exophthalmic goitre results in increased metabolism, which implies that the tissues use more oxygen in unit time, and that they therefore must be supplied by more oxygen from the circulating blood. This may be done in two ways: the output of the heart may increase, or the tissues may abstract more oxygen from each unit of blood passing through them. If the heart is normal it is the first mechanism which is chiefly used, and it is established that the output of the heart per minute varies directly with the rate of metabolism. The second mechanism is only used in fairly advanced heart failure, when the heart is unable to increase its output sufficiently. It may be taken that in patients with normal or only slightly diseased hearts when thyrotoxicosis occurs the resting output of the heart per minute is increased in proportion to the increase in the basal metabolic rate (B.M.R.), so that with the patient at complete rest in bed the heart may be working as hard as if he were walking continuously at a rate of four miles per hour for twenty-four hours every day. Moreover, in thyrotoxicosis the body is an inefficient machine, so that on exertion there is a disproportionate rise in oxygen consumption above the already high resting level, with a corresponding excessive increase in the heart's work above the high basal level. The increased cardiac activity, though necessary to supply the required amount of oxygen to the tissues, is not altogether due directly to an increased call from the tissues, but in part, at least, to an increase in the intrinsic metabolism of the heart itself.[2 18 50] The excised hearts of animals fed on thyroid continue to beat more rapidly than normal outside the body, and on section of the bundle of His, producing complete heart-block, the rate of the isolated ventricle is greater than normal. Even tissue cultures of heart muscle fibres of the embryo chick beat more quickly under the influence of thyroxine. The increased intrinsic metabolism of the heart is shown by the greater oxygen consumption of the hearts of thyroid-fed animals. This makes the heart more susceptible to injury, and cutting off of the oxygen supply or the accumulation of lactic acid results much more quickly in the cessation of the contractions of the isolated heart.

The heart's output may be increased by an increase in rate or by an increased output per beat. In thyrotoxicosis both methods are used. Tachycardia is one of the cardinal symptoms of exophthalmic goitre, and is present in practically every case. There is no simple method of estimating the output of the heart per beat in man, but in any individual it may be taken as roughly proportionate to the pulse pressure. The diastolic pressure is a measure of the peripheral resistance to the blood flow, and the extent to which the blood pressure rises above the diastolic level during systole depends on the volume of blood thrown at each beat into the aorta. Of course other factors, such as the capacity and elasticity of the arteries, are also involved, but these presumably remain constant over short periods for any one individual. In most cases of thyrotoxicosis there is an increase in the pulse pressure, with a slight rise in the systolic and a slight fall in the diastolic pressure. So close is the relation between the pulse rate and pulse pressure and the cardiac output on the one hand, and between the cardiac output and the metabolic rate on the other hand, that often a close approximation to the true metabolic rate can be arrived at by using Read's formula, which in round figures is as follows: B.M.R. equals 3/4 (pulse rate plus 3/4 pulse pressure) minus 72.

Clinical Features

The effect on the heart of this increase in its work depends partly on its condition before the onset of thyrotoxicosis. There is always overaction of the heart, usually immediately evident on examining the chest, and felt by the patient as palpitation, particularly on emotion or exertion. The overaction may impart a slight vibration to the apex beat, which may be mistaken for a slight presystolic thrill and murmur, and it often also makes the heart appear to be larger than it actually is, though it sometimes really is somewhat enlarged in long-standing cases, even in the absence of independent heart disease. No doubt this enlargement, which can be reproduced in animals fed on thyroid, is due to the long-continued cardiac overwork. Necropsy statistics (which, however, include chiefly the worst cases) show slight cardiac enlargement with hypertrophy and dilatation of all the chambers, but especially of the left ventricle, in 50 to 60 per cent. of all cases uncomplicated by independent heart disease.[30 38 40] The *x*-ray shows cardiac enlargement in 30 to 45 per cent. of all cases of thyrotoxicosis.[1 14 31 38] It is commonest in the older patients, and in those with auricular fibrillation, heart failure, and independent heart disease. It is rare in young patients without auricular fibrillation or independent heart disease.[1] The enlargement is chiefly to the left ; the pulmonary arc is somewhat prominent ; there is little prominence of the right auricle ; and the left auricle, in the oblique view, is normal.[38] When once cardiac enlargement has occurred it seems to be permanent, there being no significant change in the heart's size after successful partial thyroidectomy.[14]

AURICULAR FIBRILLATION

Auricular fibrillation ultimately supervenes in many cases of thyrotoxicosis, and was present in eleven out of fifty-three cases (21 per cent.) electrocardiographed at the Queen's Hospital in the last three years. This proportion is too high, as some cases with a regular rhythm were not electrocardiographed. During this period there were 115 cases of auricular fibrillation, so that a diagnosis of thyrotoxicosis was made in about 10 per cent. of all cases of auricular fibrillation. Various observers report auricular

* A post-graduate lecture given at the Queen's Hospital, Birmingham, on May 31st, 1935.

fibrillation in 6 to 27 per cent. of cases of thyrotoxicosis. It arises proportionately twice as frequently in males as in females, and its incidence increases with the patient's age and with the duration of the disease. It also appears transiently after thyroidectomy in 7 per cent. of patients with previously normal rhythm.[21] It has been suggested that the liability of the thyrotoxic heart to develop auricular fibrillation is due to an increased susceptibility to the action of adrenaline, since in thyroid-fed rabbits an injection of adrenaline often caused the onset of auricular fibrillation.[45] Fibrillation is frequently accompanied by marked cardiac enlargement and heart failure, and in most cases of thyrotoxic heart failure fibrillation is present. Other abnormalities in rhythm are rather uncommon. Auricular flutter was found in one series in 2 per cent. of cases.[14] Extrasystoles may occur, though in non-thyrotoxic tachycardia they are rare. Goodall[28] found a prolonged P–R interval (partial heart-block) in 30 per cent. of cases, but this has not been confirmed. Occasional cases with complete heart-block have been described,[16] but this was always due to independent heart disease.

CARDIAC FAILURE

In many cases congestive heart failure with dyspnoea, cyanosis, gross oedema, etc., ultimately develops, while angina pectoris is less common.[11 33 44] That the relation of these symptoms to the abnormal activity of the thyroid gland is intimate is shown by the dramatic recovery which almost invariably takes place after successful subtotal thyroidectomy; but evidence is accumulating to show that thyrotoxicosis is not the only factor. In some patients the most severe and even fatal thyrotoxic crises may arise without the least sign of heart failure, while in others the presenting symptoms may be those of heart failure, and the evidence of thyrotoxicosis may readily be missed. Heart failure supervenes more commonly in cases of "toxic adenoma" (with a nodular goitre, often inconspicuous eye signs of Graves's disease, only slight wasting, and slight elevation of the B.M.R.) than in cases of "primary exophthalmic goitre" (with uniform thyroid enlargement, marked eye signs, rapid wasting, and a high B.M.R.), in which there may be no symptoms of heart failure. The difference is so striking that it has even been suggested that the thyroid adenomata produce a toxin which specifically damages the heart. It has been amply demonstrated, however, that "toxic adenoma" is merely the chronic stage of exophthalmic goitre, which is a disease with periodic remissions and exacerbations. In the remissions the gland undergoes involution, which in some parts is excessive, in others incomplete. These areas of hyper- and hypo-involution are specially involved in successive exacerbations, and progressively enlarge, with compression and fibrosis of the surrounding thyroid tissue, to form pseudo-capsules round the "adenomata."[9 20 23 42 43]

The difference in the reaction of the heart in "primary exophthalmic goitre" and "toxic adenoma" is due to a difference in the heart, not in the thyroid. Heart failure chiefly occurs in older patients, and is therefore commonly associated with toxic adenoma, which, being the chronic stage of exophthalmic goitre, is also found in the later age groups. Of seventy-two thyrotoxic patients over the age of 40[2] heart failure was present in twenty-eight (39 per cent.), while in 128 under 40 years of age failure was present in only nine (7 per cent.). It is thought that the higher incidence in middle and old age is due to the supervention of independent degenerative cardiovascular disease, particularly coronary artery sclerosis and high blood pressure. The perfectly normal heart is able to stand the strain of the perpetual increase in its work in thyrotoxicosis, but if there is even slight independent cardiovascular disease heart failure takes place. This is supported by the fact that of the nine patients with heart failure under the age of 40[2] five had mitral stenosis, in one there was post-mortem evidence of rheumatic carditis, a seventh had syphilitic aortitis, and in only two could no definite evidence of independent heart disease be obtained. Again, in twenty-seven cases of thyrotoxicosis[40] examined post mortem seven patients had died of heart failure, and five of these had gross independent heart disease; while of six patients with independent heart disease five died of heart failure. Auricular fibrillation is also an important factor in causing cardiac failure, which was found in 3 per cent. of cases with a normal rhythm, and in 30 to 60 per cent. of cases with fibrillation.[1] In the patients with angina pectoris no doubt there is some coronary arteriosclerosis, restricting the volume of blood delivered to the overworked heart.

Pathological Changes in the Heart

Evidence as to direct damage to the heart has been sought from histological studies after death and from electrocardiographic changes. Goodall[28] described bundles of necrotic heart muscle fibres infiltrated with round cells, and capillary dilatation with endothelial proliferation. Rake[40] found similar changes in five of twenty-seven cases, but in three of these there was also rheumatic or syphilitic heart disease. Weller,[49] in thirty-five cases of uncomplicated thyrotoxicosis, found patches of fibrosis of the heart in 80 per cent. and cellular infiltrations in 31 per cent., but similar changes were observed in controls in 52 per cent. and 17 per cent. of cases respectively. Eight of seventeen thyroid-fed guinea-pigs[40] had patches of necrotic heart muscle surrounded by round cells (changes similar to those described by Goodall), but all of these died of bronchopneumonia. Of the nine without pneumonia, only one had a few small patches of necrosis. The patches of necrotic heart muscle, of which the fibroid patches described by Weller are no doubt the late stage, therefore seem to be due to infection not thyrotoxicosis. The large proportion of normal controls revealing similar changes robs Weller's figures of significance. Thus no cardiac lesion due to thyrotoxicosis has yet been demonstrated, except for moderate cardiac enlargement, no doubt due to persistent overwork.

Electrocardiographic Changes

Goodall[28] reported partial heart-block (prolonged P–R interval) in 30 per cent. of cases, but this has not been confirmed, and was found in none of the cases at the Queen's Hospital. Burnett[14] reported slurred R waves in 74 per cent. of sixty-two cases, but this, too, has not been confirmed. The changes commonly described are tall P waves and T waves, though these occur in only about 25 per cent. of cases and are often not conspicuous.[19 28 29 34 35 38] The T wave may become lower after thyroidectomy, and in myxoedema it is usually flat or inverted. Hamburger[29] says that tall P and T waves and low R waves indicate high sympathetic tone, not heart disease. The electrocardiographic evidence of direct cardiac damage due to thyrotoxicosis is thus no more conclusive than the pathological. Nevertheless the frequent occurrence of auricular fibrillation is evidence of an important functional change in the heart muscle. That it is not due to structural changes in the heart is shown by the common spontaneous reversion to normal rhythm shortly after successful thyroidectomy.

Blood Pressure

A slight rise in systolic and slight fall in diastolic pressure is common in thyrotoxicosis. Burnett[14] says that in 19 per cent. of cases the systolic pressure is over 160, and in 22 per cent. the diastolic pressure is over 90. Parkinson[39] has recently reported 100 cases of hyperpiesis in which there was some evidence of thyrotoxicosis. The pulse rate ranged from 90 to 110, auricular fibrillation was present in twenty-three, and there was some thyroid enlargement, usually minimal, in all. The B.M.R. was often high, but it is known often to be raised in high blood pressure in the absence of thyrotoxicosis. Parkinson suggests that thyrotoxicosis may be a cause of hyperpiesis, but it might be objected that the

evidence of thyrotoxicosis in his cases is so slight, and hyperpiesis after middle age is so common, that the connexion between thyrotoxicosis and hyperpiesis is not proven. Rosenblum[44] found no significant change in blood pressure in sixty-nine patients after subtotal thyroidectomy, and we found no significant change in seven patients after total thyroidectomy.[13] Davis[17] observed in twenty-nine cases after total thyroidectomy that the blood pressure sometimes rose, sometimes fell, sometimes was unchanged. On the other hand, the blood pressure was high in fourteen of thirty cases of myxoedema, and was reduced by thyroid treatment in eleven of these.[32]

It may thus be concluded that there is as yet no certain evidence that thyrotoxicosis directly damages the heart or that it causes hyperpiesis. When heart failure takes place it is due chiefly to the persistent increase in the cardiac work necessitated by the raised B.M.R. ; partly to the development of auricular fibrillation, owing to functional changes in the heart muscle ; and partly to the presence of independent cardiovascular disease, usually rheumatic or syphilitic in young patients, and coronary sclerosis or hyperpiesis in older ones, which makes the heart unable to withstand successfully the strain of the perpetual increase in its work imposed by the raised B.M.R.

Diagnosis

In cases of thyrotoxic heart failure diagnosis is particularly important, as there is little response to treatment until the thyrotoxicosis is controlled. Often the signs of thyrotoxicosis (goitre, exophthalmos, wasting, etc.) are inconspicuous. Estimation of the B.M.R. is of comparatively little importance, as in many cases of thyrotoxic heart failure it is not very greatly raised, and it is often somewhat raised in non-thyrotoxic heart failure.[36] The presence of heart failure in the absence of valvular disease, hyperpiesis, syphilitic aortitis, or electrocardiographic evidence of myocardial degeneration secondary to coronary artery narrowing, should prompt a careful search for evidence of thyrotoxicosis. Again, auricular fibrillation is usually associated with rheumatic heart disease, coronary arteriosclerosis, or thyrotoxicosis. In the absence of the two former a specially careful search for evidence of thyrotoxicosis should be made. Tachycardia, in the absence of pyrexia, is common in nervous patients, but it disappears during sleep, while in thyrotoxicosis it persists—though at a somewhat lower level—even during sleep.[12] The presence of numerous extrasystoles in spite of tachycardia is unusual except in thyrotoxicosis.[46]

If suspicion is aroused by any of these points it may be noticed that the eyes are very bright and have a slightly staring expression ; or that one eye is slightly more prominent and has a wider palpebral fissure than the other ; or a firm nodular thyroid gland may be felt on careful palpation ; or there may be a fine tremor, flushing or pigmentation of the skin, nervousness, loss of weight, etc. The diagnosis may then be confirmed by finding an abnormal B.M.R. The normal range for the B.M.R. is minus 15 per cent. to plus 15 per cent., so that a rate of plus 12 per cent., though within the normal range, may be high for a patient whose normal rate is minus 15 per cent. In such cases there is usually a marked fall in the B.M.R. under the influence of rest and Lugol's iodine, and this is a help in arriving at a diagnosis in a doubtful case. It is also said that while in normal persons and in thyrotoxic patients there is a marked rise in the metabolic rate after a meat meal, there is either no change or actually a fall in patients with non-thyrotoxic heart failure.[7] This may possibly prove of some value in differentiation from cases of non-thyrotoxic heart failure with a raised B.M.R.

Prognosis

In the absence of partial thyroidectomy the prognosis is bad. There is usually little or no response to treatment by rest and digitalis when once auricular fibrillation and congestive failure have set in. Digitalis is often unable even to reduce the tachycardia of auricular fibrillation, though in some cases with only slightly raised B.M.R. there may be some reduction in the heart rate. Death is usually due to heart failure, though sometimes to pneumonia or other intercurrent disease. Partial thyroidectomy gives much more hope of improvement or cure, although congestive failure naturally adds greatly to the operative risk, and the operative mortality in the presence of failure has been placed as high as 20 per cent.[6] The risk of not operating, however, is even greater.

In successful cases there is a dramatic improvement in the congestive failure, which often disappears altogether in a few days. Auricular fibrillation disappears spontaneously in about half the cases after the operation, and in most of the remainder it can be dispelled by a few doses of quinidine. In patients observed for years after successful thyroidectomy there is no further evidence of heart disease unless independent heart disease was previously present.[4 41 44] The prognosis in cases surviving the operation is thus very good, and the high operative mortality in patients with severe congestive failure is therefore a strong argument for early thyroidectomy in cases of thyrotoxicosis, before heart failure develops.

Treatment

Partial thyroidectomy is the essential step in treatment, but it is necessary first to get the patient into the best possible condition to stand the operation. He should therefore be kept at complete rest in bed, and should be given 5 to 10 minims of Lugol's iodine in milk thrice daily. This usually leads to temporary improvement in the thyrotoxicosis, and often in the heart failure. If auricular fibrillation is present digitalis leaf (1 to 2 grains thrice daily) should be prescribed, though it usually has little effect. Mercurial diuretics (neptal, salyrgan, etc.) should be employed if necessary, as it is undesirable to operate if oedema is still present. After ten to fourteen days of this treatment the patient will usually be as fit for operation as he is ever likely to be, and subtotal thyroidectomy should be performed, with local anaesthesia or a basal hypnotic followed by gas and oxygen. Only a small shaving of the gland should be left on each side, to safeguard the parathyroids and the recurrent laryngeal nerves. It is almost impossible to remove too much gland, as the fragments left always hypertrophy after the operation. In any case slight myxoedema is preferable to persistent hyperthyroidism, as it can be controlled by thyroid extract if necessary.

With adequate pre-operative treatment the operation is usually well borne, and in a few days all signs of heart failure disappear. Auricular fibrillation, if present, disappears spontaneously in about half the cases. If it persists quinidine should be given, beginning not later than a week after the operation. This restores normal rhythm in over 90 per cent. of the cases in which it does not return spontaneously. If the administration of quinidine is delayed there is more risk of the fibrillation proving permanent.[1] In most cases successfully treated by thyroidectomy the patient may, after a holiday, gradually be allowed to return to full activity without suffering any further inconvenience from her cardiac symptoms.

THE HEART IN MYXOEDEMA

While the cardiac complications of thyrotoxicosis have been known since hyperthyroidism was first recognized, it has only recently been shown that the heart is usually abnormal in myxoedema. The abnormality reveals itself chiefly by cardiac enlargement and by electrocardiographic changes. The incidence of cardiac enlargement as disclosed by *x*-ray examination has been variously estimated at 20 to 83 per cent. by different observers.[32 37] In a small

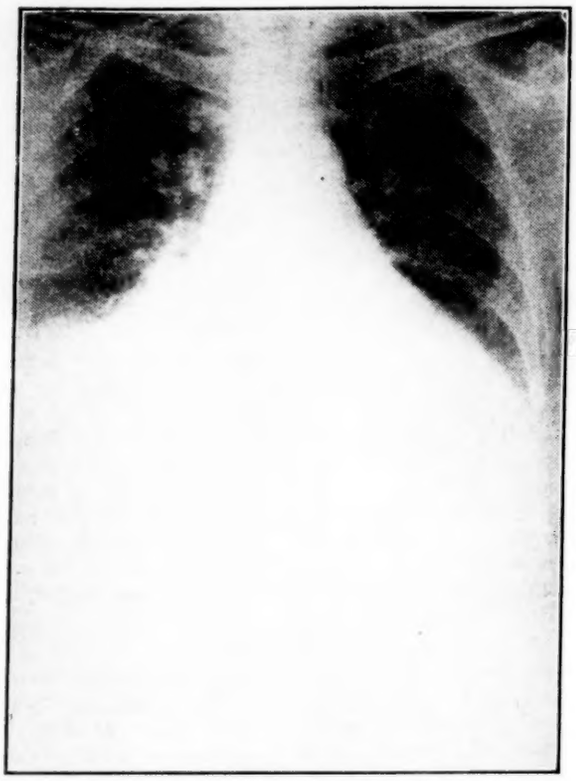

Fig. 1A.—X-ray of heart of patient with spontaneous myxoedema, before treatment, showing marked enlargement.

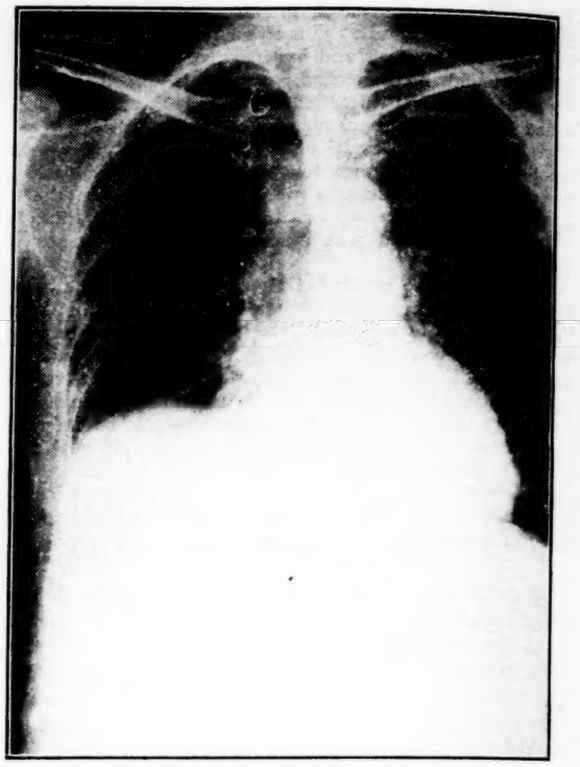

Fig. 1B.—Same patient after control of myxoedema by thyroid extract, showing diminution in size of heart.

series of six cases of spontaneous myxoedema personally observed there was cardiac enlargement in all. The heart shrank after treatment by thyroid extract in five. In three the diminution in size under treatment was only moderate, but in two the previously greatly enlarged heart returned almost to normal size (Figs. 1A and 1B). Cardiac enlargement also occurs in artificial myxoedema produced by total thyroidectomy (Figs. 2A and 2B). Lerman[32] reports that in spontaneous myxoedema the heart shrank by 1 cm. or more in twenty of the twenty-five cases in which it was enlarged, and in four of the remaining five hyperpiesis was present. In some of the recorded cases the heart, which practically filled the chest, returned almost to normal size after treatment. Dilatation of the

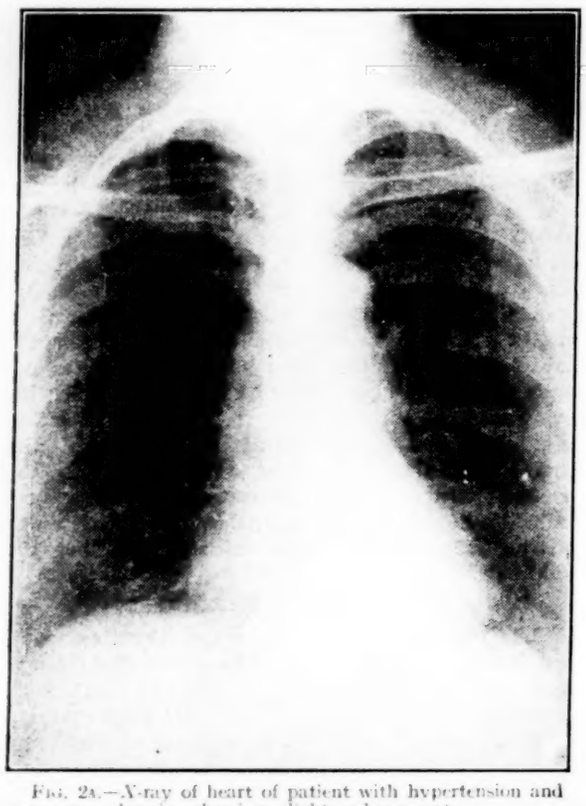

Fig. 2A.—X-ray of heart of patient with hypertension and coronary sclerosis, showing slight enlargement.

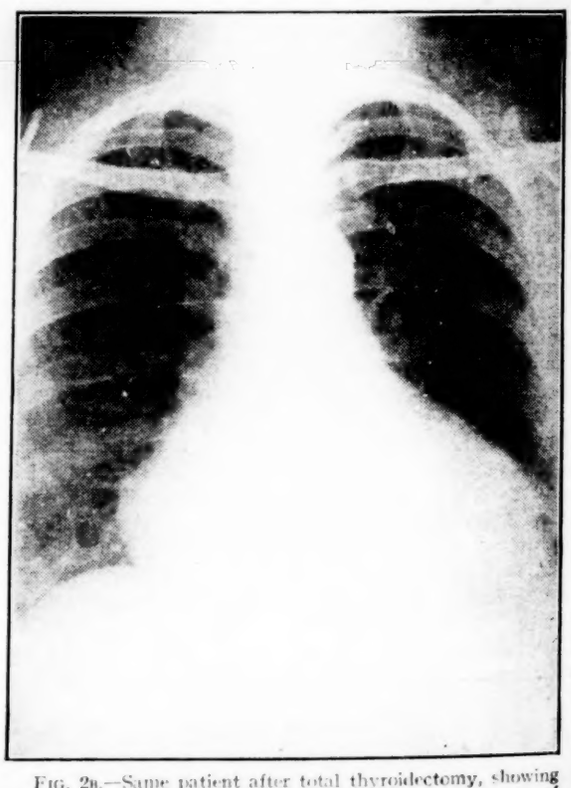

Fig. 2B.—Same patient after total thyroidectomy, showing great increase in heart size coincident with occurrence of myxoedema. Symptoms were greatly improved at this stage.

heart, myxoedematous changes in the heart muscle, and pericardial effusion have been suggested as possible causes of the enlargement of the cardiac shadow, but no definite conclusion has been reached.

The electrocardiogram typically reveals diminution in the size of all the waves.[47] The QRS complex is of low voltage, and the T waves are flat or inverted. Under treatment the P and QRS waves become larger, and the T waves become upright. These changes were found in five of the six personal cases of myxoedema (Figs. 3A and 3B), and the reverse changes (diminution of the voltage of the QRS complex, and flattening or inversion of the T waves) was observed in many of the cases of myxoedema produced by total thyroidectomy. These changes are practically constant in myxoedema.[32 27] Occasionally the QRS and T waves, though low, are within the normal limits; but even here they usually increase in size under treatment. Occasionally there is

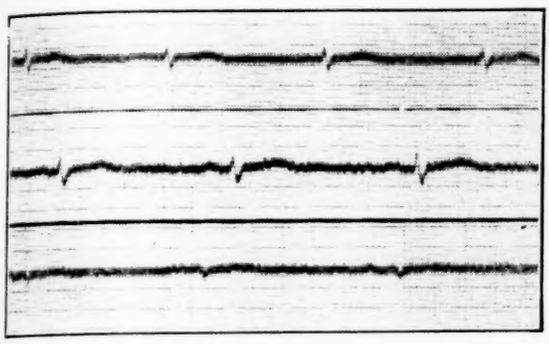

FIG. 3A.—Electrocardiogram of a case of spontaneous myxoedema, showing small P and QRS waves, and almost flat T waves.

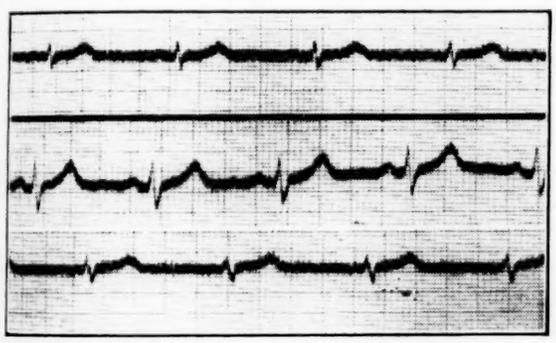

FIG. 3B.—Same case, after control of the myxoedema by thyroid extract, showing well-marked P waves in Lead II, somewhat increased size of the QRS complex in all leads, and well-marked T waves in all leads.

partial heart-block or bundle-branch block,[22 27] which disappear under treatment. The only other constant cardiac signs in myxoedema are a slow pulse and a somewhat low pulse pressure, indicative of a low cardiac output. The blood pressure is sometimes high,[32] and then often falls, sometimes to normal, under treatment.

Heart Failure

In spite of the constancy of these changes, cardiac symptoms are unusual, though many patients have slight dyspnoea. It seems likely that the cardiac enlargement and the electrocardiographic changes indicate impaired cardiac efficiency, but at the same time the lowered metabolism and lessened demand of the tissues for oxygen-containing blood allow the heart to diminish its work to a level which it is easily able to maintain, inefficient as it is. Nevertheless, occasional cases of heart failure in myxoedema have been described. In one[22] treatment by rest and digitalis was ineffective, but the heart failure disappeared under treatment with thyroid extract. When treatment was suspended, heart failure returned as the myxoedema reappeared, but disappeared again when treatment was resumed. This, however, is most unusual. In two of our six cases of spontaneous myxoedema there was ascites, which disappeared under treatment, but there were no other signs of heart failure in this or any of the other cases, and Lerman[32] found only slight or no signs of heart failure in thirty cases of myxoedema, though cardiac enlargement was present in twenty-five and electrocardiographic changes in all.

Coronary arteriosclerosis is common in myxoedematous patients, and usually causes no symptoms, since the heart does comparatively little work and the narrowed coronary arteries are able to deliver enough blood for its needs. If large doses of thyroid extract are given, metabolism, and with it the heart's work, rapidly increases. The blood flow through the narrowed coronary arteries may then be insufficient, and severe, even fatal, angina may occur. Treatment should therefore be begun with very small doses of thyroid extract, gradually increased. If angina supervenes the dose should be reduced. Occasionally treatment has to be abandoned because of the appearance of severe angina as soon as the metabolic rate begins to rise.

THYROIDECTOMY IN HEART DISEASE

The dramatic disappearance of thyrotoxic heart failure after subtotal thyroidectomy encouraged certain American workers to try thyroidectomy in the treatment of non-thyrotoxic heart failure.[9 10 11 25] The rationale is as follows. In failure, the heart is able to maintain a supply of oxygen-containing blood adequate for the needs of the tissues only with great difficulty, or not at all. Thyroidectomy diminishes metabolism and the oxygen consumption of the tissues, so that their demands for oxygen-containing blood are satisfied, and the symptoms of heart failure diminish or disappear.

In less advanced failure the heart is able, with difficulty, to maintain an adequate supply of blood to the tissues, at least during rest, by the mechanism formulated in Starling's law of the heart. This states that the output of the heart in systole varies (within limits), as its size in diastole. Normally, during exercise, the return of blood to the heart is increased and the venous blood pressure rises. This causes distension of the heart during diastole, when the venous blood pressure is transmitted through the open mitral and tricuspid valves to the ventricles, with a correspondingly greater systolic contraction and the expulsion of more blood into the aorta. If the heart is diseased it must be more than normally distended during diastole if it is to expel the normal volume of blood during systole. This distension is produced by a rise in venous blood pressure. In this way, by a progressive rise in venous blood pressure, the cardiac output, at least at rest, can long be kept within normal limits in spite of advanced myocardial disease.

Now a high pulmonary venous pressure, associated with diastolic distension of the left ventricle, is conducted back to the pulmonary capillaries, which are distended, thus encroaching on the pulmonary air space and diminishing the vital capacity (the greatest possible volume of air expired after the deepest possible inspiration). Dyspnoea occurs when the tidal air (volume of air taken in at each inspiration) exceeds one-third of the vital capacity. The rise in pulmonary venous pressure may thus make the vital capacity less than three times the tidal air, so that dyspnoea takes place in spite of a normal cardiac output. Similarly, the rise in systemic venous pressure necessary to maintain the normal output of the right ventricle may cause hepatic enlargement, oedema, etc. If the thyroid is removed at this stage the needs of the tissues for oxygen-containing blood are lowered and the heart can reduce its output to below

the normal level. It can maintain this diminished output without a rise in the venous pressure, so that the distension of the pulmonary capillaries is lessened, the vital capacity is increased, and dyspnoea disappears. There is a similar disappearance of hepatic engorgement and oedema owing to the fall in systemic venous pressure.

In Angina Pectoris

The argument in angina pectoris is similar. Angina is due to an insufficient supply of blood to the heart through the coronary arteries when the heart's work is increased by exertion or emotion, though the supply is sufficient when the heart is acting quietly. Thyroidectomy so diminishes the work the heart has to do that the amount of blood the coronary arteries are able to deliver is sufficient even during exertion, and the angina disappears. It has been found that the angina disappears almost immediately after the operation, before there is much reduction in the B.M.R., and it has been suggested that though the permanent results are due to the lowered B.M.R. the immediate benefit is due to interruption of the sympathetic sensory fibres from the heart at the time of operation. In support of this it is said[18] that in patients with pain on both sides of the chest, removal of one lobe of the thyroid relieves the pain only on the same side of the chest.

Exposure of the thyroid to *x* rays or radium was first tried as a method of reducing thyroid function, but it was soon found that these, in doses harmless to the surrounding structures, had no influence on the normal thyroid. Next, subtotal thyroidectomy was tried, but this proved only temporarily successful, as the thyroid tissue left behind soon regenerates, the B.M.R. rises again, and the condition of the patient is soon as bad as before. Nothing short of removal of the whole thyroid gland[5] is effective, though naturally this has drawbacks. The patients often develop myxoedema, though this may take months and sometimes never occurs, in spite of a great fall in the B.M.R.[27] The myxoedema, however, can easily be kept in check by small doses of thyroid extract. Myxoedema is almost always present when the B.M.R. falls below minus 30 per cent. Between minus 30 and minus 20 there are symptoms only of slight hypothyroidism. Above minus 20 there are no hypothyroid symptoms at all.[24] The B.M.R. may thus be allowed to fall between minus 20 and minus 30, with great relief to the heart and without the appearance of serious hypothyroidism. Again, care is necessary to avoid damaging the recurrent laryngeal nerves and removing all the parathyroids.[24 26] In the American series a fall in the serum calcium and slight signs of parathyroid deficiency, without actual tetany, occasionally took place. This was readily controlled by the administration of calcium and a vitamin D preparation for a few days. After this the parathyroids left behind hypertrophy to compensate for those lost.

Selection of Cases

We have followed substantially the indications set forth by the American originators of the operation. Only patients incapacitated by heart failure or angina, in whom all other treatment has not sufficed to restore a reasonable amount of activity, are subjected to operation. But it is hopeless to operate on moribund patients, or on those with such advanced heart failure that rest, digitalis, diuretics, etc., do not abolish gross oedema. All our patients have had one or more courses of ordinary treatment in hospital, and though oedema has subsided when present, they have been quite unable to work. Angina has persisted in spite of rest in bed and prophylactic nitroglycerin.

Again, the patients must not be suffering from actively progressing heart disease (active rheumatic carditis, active syphilitic aortitis, active coronary sclerosis, with repeated thromboses, etc.). In such cases the rapid deterioration of the heart would quickly nullify the beneficial results of diminishing its work. Finally, the pre-operative B.M.R. must not be below minus 15 per cent., since, owing to the occurrence of myxoedema, the B.M.R. cannot be allowed to fall below minus 30 per cent., and this fall is too slight to produce appreciable benefit. If these indications are observed it will be found that the field for the operation is more restricted than was at first thought would be the case. We have added only one to the series of six reported last year, and another is being prepared for operation. We have recommended operation to three others we considered suitable, who, however, refused it.

Results

Though the patients all have very grave heart disease, the operative mortality is low. In the American series there were two operative deaths, both in patients practically moribund before operation. In our seven cases there were no operative deaths, and none of them gave cause for anxiety on the operating table or in their post-operative course. Encouraging remote results have been reported by the American observers, many of whose patients have been able to return to light, or even full, work. Our own small series supports these conclusions, though not every case is benefited to a significant degree. One was operated on six months ago, the others twelve to seventeen months ago. Two of the seven patients are dead (Cases 4 and 6 of our previous report)—one six weeks and the other thirteen months after operation. Both died of cerebral haemorrhage (confirmed at necropsy), and in both the blood pressure, before and after operation, was always above 200. In both the congestive failure and angina were relieved after operation, and in Case 4 (the patient dying thirteen months after operation) the relief was great. Before operation she was unable to do any housework, and was scarcely able to get about. After the operation her cardiac symptoms almost disappeared, and she was soon able to return to full housework, including the heavy household washing. The headache, giddiness, tinnitus, etc., however, still persisted, until she was struck down by the cerebral haemorrhage.

Two patients (Cases 3 and 5 of our previous report) have not greatly improved. In Case 3 (hypertension, coronary sclerosis, congestive failure, and angina) the patient improved somewhat for the first few months after operation, but has since gradually relapsed, presumably because of progress of her heart disease, and she still has severe congestive failure, with orthopnoea, cyanosis, oedema, and ascites. She refuses to go to bed, and her exercise tolerance is slightly better than before operation. She can get about with difficulty, but is unable to work. In Case 5 (old coronary occlusion) the patient was before the operation incapacitated by angina, which did not yield to any treatment. Since the operation the angina is much less readily produced, but he is dyspnoeic on exertion, though he can get about more easily and is more comfortable. He is still unable to work. The patient operated on six months ago (not included in our previous series) had congestive failure and angina, and was so dyspnoeic that for a month before operation she had been unable to go to bed, and had to sit up in a chair all night. She was unable to walk more than a few steps without being pulled up, either by dyspnoea or pain. She is now much more comfortable, can sleep in comfort propped up on three pillows, can walk slowly upstairs without resting, but is still unable to do any housework. In Case 1 (hypertension, coronary sclerosis, congestive failure, and angina) the patient is much improved. She now gets only occasional angina on excessive exertion, is much less dyspnoeic, and can get about comfortably and do

some of her housework. The best result was obtained in Case 2 (coronary sclerosis, angina pectoris). Before the operation the patient could walk only a few yards without being stopped by pain. He is now back at full heavy work, with little or no pain.

We think it fair to say that the two deaths from cerebral haemorrhage were secondary to the hypertension, which is not affected by the operation. The cardiac symptoms were improved in both, in one greatly. Of the remaining five cases two were failures, the others successful in varying degree, in one with return to full activity. When it is recalled that all seemed to be hopeless cases, in which every other form of treatment had failed, we feel that the measure of success attained has been gratifying. The two failures, however, show that further investigation is required in order to work out more clearly the indications for the operation.

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RESULTS OF ANTE-NATAL ADMINISTRATION OF QUININE*

BY

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Although the idea of giving small doses of quinine during the last few weeks of pregnancy is by no means new, the literature on the subject is scanty. I have been able to find only two papers in the English literature which give results and figures showing the effect on labour, although several others mention the method and claim certain advantages for it.

Mitchell[1] described results of giving quin. sulph., 1½ grains t.d.s., during the last three weeks of pregnancy to a series of 400 cases spread over seven years. He made strong claims for the advantages of the method, which I quote verbatim:

"(*a*) The general health is improved.
"(*b*) Labour is made easier and shorter.
"(*c*) Uterine retraction is uniformly good.
"(*d*) There is no increased tendency to premature labour, precipitate labour, retained placenta, perineal laceration, or after-pains."

The author gave no detailed figures, but said that in "straightforward cases" duration of labour averaged six hours in primiparae and three in multiparae. The length of labour was calculated from the onset of pain severe enough "to make the patient hold on to a chair."

Buddee[2] used a similar method at Queen Charlotte's in 100 cases. He gave details of the labours compared with controls. He found no support for Mitchell's claims, with the exception of a possible benefit to the patient's general health. It is noteworthy that whereas Mitchell referred only to "straightforward cases," the only cases excluded by Buddee were those of albuminuria and gross disproportion.

Such great disparity between the only two series of cases published calls for further inquiry. If Mitchell's claims can be confirmed we have at our disposal a simple method of reducing the great dangers of everyday obstetrics—namely, the abuse of forceps, haemorrhage, and sepsis.

It appears to me that, in order to test the action of quinine on the uterus from the clinical point of view, it is necessary first of all to observe its effect on a series of cases which appeared normal during the ante-natal period. This should give an idea of the effect on the uterine action under conditions which are as near as possible to standard. If any beneficial result can be shown one may then consider the possible uses of the method in abnormal cases. But the inclusion of abnormal cases in the first series introduces so many varying factors that it becomes impossible to decide what part, if any, the quinine is playing.

Material Reviewed and Results

This short paper gives the results of the ante-natal use of quinine in fifty consecutive normal primiparae, with controls. By "normal" I mean cases which showed no abnormality whatever during the ante-natal period. Thus I have excluded all patients below the age of 18 and above 30, all cases where the head was not engaged by the thirty-eighth week of pregnancy, and also cases of albuminuria, heart disease, or other complications of pregnancy. All patients were given quinine bihydrochloride, 2 grains t.d.s., in tablet form, from the thirty-sixth week of pregnancy onwards. The results obtained are shown below.

Onset and Duration of Labour.—The figures are taken from fifty cases in which labour started after the thirty-

* A paper read before the Midland Obstetrical and Gynaecological Society, May 20th, 1935.

eighth week. In addition, two cases in the quinine group and eleven in the controls started before this time; details of these labours are not included in the results. I am sure that the incidence of premature labour in the control group is abnormally high, because after the thirty-eighth week the time of onset of labour was approximately equal in both groups. Only one case—a control—went more than two weeks over the calculated date of labour. The other results are shown in the tables.

	Time	Quinine	Control
Stage 1:	Under 12 hours ...	33 (66 %)	20 (40 %)
	12 to 24 hours ...	12 (24 %)	21 (42 %)
	24 to 36 hours ...	3 (6 %)	6 (12 %)
	Over 36 hours ...	2 (4 %)	3 (6 %)
Stage 2:	Under 1 hour ...	34 (68 %)	20 (40 %)
	1 to 2 hours ...	12 (24 %)	21 (42 %)
	Over 2 hours ...	4 (8 %)	9 (18 %)
Stage 3:	Under 1/2 hour ...	45 (90 %)	47 (94 %)
	1/2 to 1 hour	5 (10 %)	3 (6 %)
	Over 1 hour ...	—	—

It will be seen that in 66 per cent. of the quinine cases the first stage of labour lasted under twelve hours, as compared with only 40 per cent. of the controls. In the longer first stages controls predominate. The second stage shows similar results—namely, 68 per cent. of quinine cases were under one hour in this stage, compared with 40 per cent. of controls, which again are in excess in the long second stages. In the third stage the results are very slightly in favour of the controls.

Haemorrhage.—There was no case of severe post-partum haemorrhage in either series, and no marked difference in the amount of blood lost. Pituitrin was necessary in four cases in the quinine series, and in six of the controls.

	Quinine	Control
Under 10 oz.	32 (64 %)	29 (58 %)
10 to 20 oz.	7 (14 %)	7 (14 %)
Over 20 oz.	6 (12 %)	6 (12 %)
Not noted	5 (10 %)	8 (16 %)
Pituitrin	4 (8 %)	6 (12 %)

Lacerations were almost equal in incidence.

	Quinine	Control
First degree	13 (26 %)	13 (26 %)
Second degree	4 (8 %)	6 (12 %)
Third degree	—	—

Puerperium.—In the quinine series four cases were morbid according to the B.M.A. standard. One of these was due to pyelitis. There were two morbid cases in the controls. None of these cases needed special treatment. *Stillbirths:* None in either series. *Forceps:* One in quinine series for foetal distress.

Conclusions

Although it is admittedly dangerous to draw conclusions from a small series of cases, certain salient facts do emerge from this investigation.

1. The tendency to onset of premature labour is, if anything, diminished by the ante-natal administration of quinine.

2. The first and second stages of labour are accelerated without damage to mother or child. Inertia is not entirely abolished.

3. The absence of cases of retained placenta or severe post-partum haemorrhage in both series makes it impossible to decide whether the incidence of these conditions is reduced or not. A much larger series of cases would be needed to prove this point. Bearing in mind the increased activity of the uterine muscle during the first and second stages of labour, one would expect a similar increase during the third stage.

4. There is no evidence of any direct influence on involution and the puerperium. Here again a larger number of cases is required.

The results suggest that the uterine action is strengthened by giving small doses of quinine during the last month of pregnancy. If we accept this fact the method is surely to be recommended as a routine for use in normal, and especially in abnormal, cases, for there are few if any conditions in obstetrics where good uterine contractions are not a valuable factor. A method which helps to secure these, and which is simple and safe enough for use in domestic practice, appears to me to deserve more attention than it has had up to the present time.

In conclusion I wish to thank my colleagues on the staff of the Birmingham Maternity Hospital, who have kindly allowed me to use their cases in preparing this paper, and also the members of the resident medical staff for their help in collecting the figures.

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FURTHER EXPERIENCE OF THE USE OF QUININE IN NORMAL LABOUR

BY

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Over five years ago one of us (D. A. M.) published a paper[1] entitled "Use of Quinine in Normal Labour." The method used owed its origin to Dr. Philip Jones of Coleford, in Somerset, and consisted in the giving of a quinine salt in small doses (1½ to 2 grains thrice daily) for a period of two or three weeks prior to the expected date of labour. At the time this paper appeared Dr. Jones and the author (D. A. M.) had observed, and carefully followed up, something over 400 cases in general practice. The beauty of the method lay in its simplicity.

During the past five years it has been shown by letters to the medical journals, by discussions in medical societies, by the thesis of one of us (H. N. B.) accepted for the degree of D.M., and by personal correspondence, that the method has attracted wide attention both in this country and abroad. Some criticisms have been fairly, and some unfairly, made, and the time seems ripe to reply to our critics and to produce further support for the original claims.

Re-examination of Claims

We propose to discuss seriatim the four claims that were originally made for the method in the paper published in the *British Medical Journal* in 1930. We do this in the light of more recent experience, paying due regard to any criticisms that may have been put forward.

1. *"The General Health of the Patients is Improved"*

We hardly feel obliged to support this claim. The undeniable tonic action of quinine in small doses should alone be sufficient argument. There is, however, stronger evidence submitted in the correspondence of Green-Armytage,[2] Gair Johnston,[3] and others in the *Journal*. Apart from this, we have noted since the earliest days of the investigation (some twelve years ago) that many patients liable to dyspepsia and heartburn in the later months of pregnancy are cured of these symptoms by the prescription of quinine. At first this was rather puzzling, as it was not realized how many of these patients were suffering from *hypo*chlorhydria, and the tendency was to treat them—unsuccessfully—with bismuth and alkalis. If it should be argued that the improvement is due to the few minims of acid used to dissolve the quinine in the original prescription, we shall not feel inclined to dispute the point.

2. *"Labour is Made Easier and Shorter"*

Considerable evidence in support of this claim has been brought forward. Apart from the letters of Green-Armytage and Gair Johnston, previously mentioned, Gordon Luker[4] considers pre-natal quinine, in combination with calcium, to be the most efficient means of preventing uterine inertia. After careful observation of fifty-three consecutive cases treated by one of us (H. N. B.) in the routine of general practice, the following conclusions were drawn:

"The first stage of labour (obliteration of the cervix and dilatation of the os uteri) takes place painlessly, and frequently without the knowledge of the patient, until it is nearly completed. The contractions of the uterus in the second stage are frequent and forceful, and the duration of the second stage is shortened. Taking as a criterion the period of incapacity due to pain, the duration of labour is conspicuously shortened. The average duration of severe pain in primiparae and multiparae was three hours and one and a half hours respectively."

It is quite obvious that this estimate of the duration of painful labour must depend upon several factors. In the first place some agreement must be reached upon the definition of "true pains" as opposed to "niggling pains." In the original paper on this method of pre-natal "quininization," "true pains" were defined, for the want of other definition, as those pains which made the patient, being up and about, stop and hold on to a chair, etc., until they had passed off. In this investigation we have both used this same standard of "true pains," but in addition one of us (H. N. B.) estimated the total duration of labour, and the following table shows the results at a glance:

General Average Figures

	Total Duration of Labour	Duration of Painful Labour
Primiparae 41)	12 hours	2¾ hours
Multiparae (12)	8 „	1½ „

Effect of the Presentation

	Total Duration of Labour	Duration of Painful Labour
Vertex, occipito-anterior (39 cases)	10½ hours	2 hours
Vertex, occipito-posterior (10 cases)	16½ „	3¾ „
Breech (4 cases)	5 „	3 „

The duration of painful labour is obviously affected by the decision of the individual practitioner on the advisability of affording relief to his patient by hypnotics, anaesthetics, and, in certain cases, by instrumental intervention. The duration of such assistance should, however, always be included in the period of painful labour, and has been so recorded in these figures.

The only serious criticism of this claim for shorter and easier labours in "quininized" patients came from Buddee,[5] who used a modified method of pre-natal quininization at Queen Charlotte's Hospital upon 100 cases, with a similar number of controls. Apart from the fact that his modification of the method was, in our opinion, unsuitable and undesirable, he made no distinction between the total duration of labour and the duration of painful labour, and it is difficult to draw a just comparison between his figures and our own.

The claim for shorter and easier labours in cases subjected to pre-natal quininization has recently been substantiated by Ganner[6] in a series of fifty hospital cases with controls. [See page 205.]

3. *"Uterine Retraction is Uniformly Good"*

It is difficult to provide positive and primary evidence of the truth of this important statement, but indirect evidence is abundant. Hewetson[7] specifically noted this point in his practice in malarious districts over seven years ago. He also remarked on the apyrexial puerperium of these quininized cases, a point inevitably to be associated with good retraction and involution, or, in modern phraseology, the "blood-tight uterus."

In the above-mentioned series of fifty-three cases there was no rise of temperature above 99.4° F. recorded on the usual morning and evening charts, and we regard this as strong indirect evidence of good retraction. In a hospital attended by one of us (D. A. M.) it was noticed that clots were rarely seen in the forty-eight hours following labour in the quinine cases, whereas in other cases the occurrence was fairly common; surely this is evidence of firm and sustained retraction. Another pointer is the fact that in the considerable correspondence on the subject which we have examined only one case of post-partum haemorrhage is recorded, and this was associated with retained placenta in a patient who had taken the quinine for one week only (Rees[8]). Previous experience of the method, extending over five years, had left the author enthusiastic over the benefits.

4. *"There is no Increased Tendency to: (a) Premature Labour"*

No such tendency has been demonstrated by anyone who has used the method. Buddee,[5] in his series at Queen Charlotte's, found a fractional increase of prematurity in the quinine cases compared with his normal controls. However, as previously mentioned, his modification of the original method might well have led to greater divergencies than this, and we do not regard it as a valid criticism.

(*b*) *"Precipitate Labour"*

It is curious that in the literature upon this subject we have found no complaints of precipitate labour after the quinine treatment. It probably occurs no more frequently than in patients who have had no quinine, although some of the labours observed by us have been remarkably quick. The explanation is twofold. In the first place there is a strong tendency to a painless, or relatively painless, first stage. When this is followed by a more than usually forceful second stage it is easy to see how *apparently* precipitate labour may result. This condition undoubtedly accounts very largely for the frequent "B.B.A." (born before arrival) cases noted in the early days of our investigations, but we have had no difficulty since we adopted the precaution of explaining thoroughly to the nurses how greatly the normal course of labour may be altered by the quinine treatment.

(*c*) *"Retained Placenta"*

Our own experience, and the comments of others, have shown only one serious instance of this complication. We have referred to it above under "uterine retraction." One of us (D. A. M.) has even had apparent success in treating with pre-natal quinine a few patients with histories of repeated retained placenta and post-partum haemorrhage.

(*d*) *"Perineal Laceration"*

The frequency of this is definitely not increased by the use of pre-natal quinine, and, as stated in the original paper, this is not surprising. Such accidents are more likely to occur when the patient has to use all her accessory muscles, aided possibly by fundal pressure

from the nurse or doctor, than when the uterus is fully equal to its task, and the attendant is free to exert restraining influence on the crowning head.

(e) "*After-pains*"

The frequency of these is not increased. In confirmation of this bald statement we can only say that the matter has never been mentioned (except by ourselves) in any correspondence on the subject.

Discussion

Such, then, is a short statement of more recent experiences in the use of quinine in normal labour, and we may well be asked to explain the limitations of the method. Claimed as a valuable aid to normal midwifery, the antenatal use of quinine is also of undoubted value in certain conditions outside normality. This region, however, is vast and ill-explored, and it is wiser to admit at once that in the realm of the abnormal each case must be considered on its own merits. There are definite contra-indications to the use of quinine, such as the presence of albuminuria, flat pelvis, or, for that matter, any condition in which, for the purpose of moulding, slow labour is desirable.

When normal cases alone are under consideration it may justly be claimed that the method solves many problems of obstetric routine. It is rarely necessary to interfere or in any way to assist the patient during the first stage. The relative freedom from pain during this period is so frequent and so striking that the patient is often seen for the first time when the cervix is fully or nearly fully dilated. When the second stage is reached both humanitarian and obstetrical principles are well served by the use of short and simple hypnotics, analgesics, or anaesthetics, according to the taste and experience of the individual practitioner. There is seldom time or opportunity for the more complicated methods of "twilight sleep," or the more drastic routine of "tissue"—and dare we add "foetal"—poisoning.

In conclusion, we should like to emphasize a point which we have repeatedly had to explain in discussions. Our method of using quinine as an ante-natal prophylactic has little in common with the use of this drug in much larger doses for the deliberate induction of labour, and we strongly deprecate the natural tendency to strive for better results by giving larger doses. Such attempts, as we know from experience, never do any good, and can only bring the method into disrepute.

Nowadays the claim is made neither by pharmacologist nor clinician that quinine is a reliable, or even effective, *initiator* of uterine contractions. Rather should it be regarded as a true tonic—that is, an agent which increases the basic tone of the uterine muscle fibres, and thus reinforces contractions which are excited by other endogenous means. This tonic action is developed by a relatively small dose, and larger doses can even produce a state of inertia and increasing paralysis of the uterine muscle. For the purpose here discussed our combined experience shows that the dose of quinine should not exceed 1½ to 2 grains given thrice daily for two to three weeks before labour is expected. Further simplification of the method, such as the use of a single daily dose of five grains, spells failure.

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THE PHYSIOLOGY OF DEEP-SEA DIVING*

BY

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The term "deep diving" defines any diving operation carried out at a depth exceeding 200 feet.

The scientific study of diving may be said to date from 1878, when Paul Bert[1] published *La Pression Barométrique*. The following thirty years witnessed the accumulation of many new facts concerning diving and caisson work, and in 1907 was published the "Report of a Committee appointed by the Lords Commissioners of the Admiralty to consider and report upon the conditions of Deep Water Diving."[10] The recommendations of this committee, for which Professor J. S. Haldane was mainly responsible, rapidly gained universal adoption, and were instrumental in reducing the morbidity attached to such work to almost infinitesimal figures. Progress, however, was inevitable, and in 1930 the Admiralty appointed a further Deep-diving Committee—the members of which included Sir Leonard Hill—to investigate the possibilities of diving to greater depths than had hitherto been considered possible.[11]

This subject can perhaps be best studied by a consideration of the three major difficulties to be overcome in deep diving. These consist of: (*a*) carbon dioxide poisoning, (*b*) oxygen poisoning, (*c*) caisson disease, or, as it may be more accurately termed, compressed air illness.

Carbon Dioxide Poisoning

Prior to the investigations of the 1907 Admiralty Committee one of the major difficulties encountered at depths exceeding 90 feet had been that the breathing of the diver became very laboured, and cases of loss of consciousness were not uncommon. This, the committee showed, was due to the pressure of carbon dioxide.

Normally, respiration is so regulated as to maintain a constant percentage of carbon dioxide in the alveolar air—that is, 5.6 per cent. At abnormal atmospheric pressures, however, it is the absolute pressure, not the percentage, of carbon dioxide in the alveolar air that remains constant—that is, a diver at 297 feet, or 10 atmospheres absolute pressure, will need ten times as much air as he would at the surface. At this depth a tension of 0.1 per cent. in the air breathed has the same effect as breathing 1 per cent. of carbon dioxide at atmospheric pressure. When the 1930 Admiralty Committee[11] began its deliberations on diving at depths exceeding 200 feet, it was faced by the problem of supplying sufficient air to the diver to prevent any accumulation of carbon dioxide, as a very large amount of air would be required to provide the necessary ventilation to an ordinary diving helmet when a diver is in deep water. The committee finally adopted a special deep-diving dress in which the diver carries a canister containing a carbon dioxide absorbent instead of the back weight—designed and produced by Messrs. Siebe Gorman and Co., of London. Air is supplied to the diver from a high-pressure air system through reducer valves which reduce the pressure from 2,500 to 180 lb. per square inch.

That this system is completely successful is shown by the figures for analysis of air in the diver's helmet at depths from 168 to 287 feet. The average figure for twenty-three dives was 0.13 per cent. of carbon dioxide. From the practical point of view it is equally successful, as by means of it very rapid descents are possible, one diver having descended to 290 feet in under two minutes without any inconvenience.

Oxygen Poisoning

The toxic effect of oxygen may be divided into two groups: (*a*) that resulting from short exposures to high pressures, and (*b*) that resulting from prolonged exposure to low pressures. The former takes the form of con-

* The substance of a lecture delivered to the Naval Medical Officers, Royal Naval Hospital, Haslar, December 6th, 1934.

vulsions, passing into unconsciousness, and even death, while the latter is seen in congestion of the lungs and sometimes pneumonia. Paul Bert[1] found that at an absolute pressure exceeding about 3 atmospheres of oxygen (corresponding to 15 atmospheres of air, or a depth of about 460 feet of sea water) animals went into convulsions and soon died, while with an exposure of several hours a pressure of even 2 atmospheres (360 feet of sea water) proved dangerous. Lorrain Smith[12] showed that fatal pneumonia may be produced after four days' exposure to an oxygen pressure of 75 per cent. of an atmosphere (corresponding to a depth of 84 feet), while at about 2.8 atmospheres of oxygen (420 feet of sea water) marked symptoms were observed in about three hours, and death in nine hours. Hill and Macleod[9] obtained similar results.

Bornstein[2] at the Elbe tunnel in 1909–10 breathed oxygen at 3 atmospheres absolute for forty-eight minutes without ill effects, but considered that this was near the limit. Leonard Hill[11] exposed baboons, goats, and smaller animals in air to pressures equivalent to 330 feet of sea water (corresponding to a little over 2 atmospheres of oxygen) for durations up to half an hour, and ever to pressures equivalent to 400 feet of sea water for shorter periods, without any signs of oxygen poisoning. Subsequently twelve divers were subjected to 2 atmospheres (absolute) of pure oxygen for one hour, and four divers to 3 atmospheres (absolute) of pure oxygen for half an hour without any ill effects being noticed. Further animal experiments suggested that with animals there is a critical point somewhere between 4 and 5 atmospheres (absolute), beyond which the onset of convulsions becomes much more rapid.

In 1933 two research workers on this subject—both naval officers—found, experimenting on themselves, that breathing oxygen at 45 lb. pressure, corresponding to 4 atmospheres absolute, brought on convulsive symptoms in sixteen and thirteen minutes respectively. In the first case violent twitching of the face was experienced, but was immediately relieved by reverting to air breathing. In the second case tremor of the lips was noticed at the end of thirteen minutes and, in spite of reversion to air breathing, this passed into clonic convulsions with unconsciousness.

The pathology of oxygen poisoning is not known, but recent work has thrown light on one aspect of the problem which is of particular interest from the point of view of diving. It is now recognized that the power of the blood to combine with carbon dioxide in the tissues and carry it to the lungs depends on the giving up of oxygen to the tissues by oxyhaemoglobin. Argyll Campbell[4 5] showed that the carbon dioxide tension in the tissues increased to a dangerous level when animals were exposed to oxygen at sufficient pressures to keep the oxyhaemoglobin unreduced, and he suggested that oxygen convulsions are due to this high tension of carbon dioxide. This was finally proved by Leonard Hill.[7]

The bearing of this problem on deep diving is twofold—namely: (1) the depth which divers can attain without risk of oxygen poisoning, (2) the use of oxygen in decompression.

Compressed Air Illness

Ever since diving has been extensively practised, one of its greatest handicaps has been the occurrence of that group of illnesses, common to both it and caisson work, known as caisson disease, or, more accurately, compressed air illness. Bert[1] showed that these illnesses were due to a supersaturation of the tissues with nitrogen during diving, which, on the diver coming to the surface, resulted in the liberation of bubbles of nitrogen throughout the body. When a diver is exposed to compressed air the blood passing through the lungs takes up an increased proportion of oxygen and nitrogen in simple solution, in accordance with Dalton's law. The oxygen and carbon dioxide in the air cause little inconvenience, as the former can be largely utilized by the tissues, and the latter, unless the air breathed is very foul, is kept at a constant pressure in the lungs by means of alterations in the rate and depth of respiration. The increased proportion of nitrogen in the blood cannot, however, be utilized, and being carried to the various parts of the body these gradually become saturated. If the pressure be now suddenly reduced to normal a state of supersaturation exists throughout the body, and the nitrogen tends to liberate itself in the form of bubbles. These bubbles may result in the onset of paralysis, asphyxia, or merely excruciating pain, depending upon their localization.

These findings of Bert have been confirmed both experimentally and at necropsies, and perhaps the most beautiful demonstration has been that of Leonard Hill,[9] who was able to show through a microscope the bubbles forming in the capillaries of a frog's web when the pressure was suddenly lowered, and disappearing again when the animal was recompressed. As a result of his work Bert[1] recommended that the pressure should be lowered slowly in order to prevent the onset of compressed air illness, and the rate of decompression he recommended was twelve minutes per atmosphere of pressure. In 1906 Hill and Greenwood[8] published the results of their investigations, in the course of which the latter had actually gone to a pressure of 92 lb. (206 feet of sea water) and been decompressed at a rate of twenty minutes per atmosphere.

This method was known as the "uniform" system of decompression, in contrast to the "stage" system which was recommended by the Admiralty Committee of 1907, and was based on the following findings:

(*a*) The progress of saturation follows a logarithmic curve, but proceeds at different rates in different parts of the body, so that while some parts are fully saturated in a few minutes others take as long as five hours.

(*b*) Desaturation after a given change of pressure downwards proceeds along the same curve and at the same rate as would saturation after the same change of pressure upwards.

(*c*) In starting a decompression from any pressure up to at least 6 atmospheres, it is safe to reduce the absolute pressure quickly to one-half. Decompression ceases to be safe when the absolute pressure becomes less than half that of the dissolved nitrogen in any part of the body.

Recent work by Campbell and Hill[6] suggests that the average rate of saturation with nitrogen is much slower than that upon which these propositions are based. They found that the goat's solid tissues—liver, brain, and bone marrow—are only about 50 per cent. saturated with gaseous nitrogen in about three to five hours during exposures to +3, +4, and +5 atmospheres pressure, whereas Boycott, Damant, and Haldane,[3] upon whose work the 1907 Admiralty Committee's findings are based, were of the opinion that goats' tissues were fully saturated in three hours. Should these findings be confirmed it is possible that some modification may be indicated in the present decompression tables.

After reviewing the whole situation and carrying out a very extensive series of experiments on goats and many actual diving trials over a period of three years, the 1930 Admiralty Committee drew up a series of decompression tables, and came to the conclusion that, by means of these tables, "diving can be carried out with safety in a rubber dress at depths down to 300 feet. Divers thus dressed have actually descended to depths in excess of this figure, but it is considered that for the present it should not be exceeded in this form of diving"[11] (p. 9).

Oxygen Decompression

The tables referred to above are based upon the use of oxygen during decompression, a procedure which had already been tested by many workers. One of the great handicaps of deep diving is the prolonged time necessary for decompression, in order to prevent the onset of compressed air illness. This time can be materially reduced if oxygen is breathed instead of air. If pure oxygen is breathed it may be assumed that the partial pressure of nitrogen entering the lungs is zero, so that the "nitrogen extracting stress" (upon which depends the length of time which must be spent at any stage during decompression) will be the same as the partial pressure of dissolved nitrogen in the body, instead of the partial pressure of dissolved nitrogen in the body less that of the nitrogen in the alveolar air at whatever depth the diver may be. That the saving of time thus obtained is considerable is shown by the fact that an "air decom-

pression" is practically two and a half times as long as an "oxygen decompression."

The factors upon which these decompression tables were finally based were as follows:

(*a*) When the exposure was such that the average saturation of the goat's tissues (taking those which are considered to half saturate in five, ten, twenty, and forty minutes respectively) was below 210 feet the original method was used—that is, that the ratio between the absolute pressure and that of the dissolved nitrogen in any part of the body should not exceed 2:1.

(*b*) When the average saturation as above exceeded 210 feet the same method of calculation was used, but with the ratio reduced to 1.75:1.

(*c*) In all cases where the pressure of the exposure exceeded 270 feet, a supplement of about 15 per cent. was added to the length of the oxygen part of the decompression[11] (p. 56).

As a result of subsequent trials a further addition of 25 per cent. was made to the length of the oxygen part of the decompression in drawing up the final tables.

THE DAVIS SUBMERGED DECOMPRESSION CHAMBER

The administration of oxygen to the diver during decompression is dependent upon the use of the Davis submerged decompression chamber, designed by Sir Robert Davis. This is a cylindrical steel chamber, large enough to hold two men comfortably, and tested to an internal pressure of 100 lb. to the square inch. This chamber is lowered to a depth of 60 feet—the first stage at which the diver breathes oxygen. The diver, having made his first few "stops" on the "shot rope," enters the chamber at 60 feet, and at once begins breathing oxygen. Subsequent "stops" are made by lowering the pressure in the chamber. Two further advantages of the chamber are: (1) if any signs of compressed air illness develop, the diver can be immediately recompressed; (2) should adverse weather conditions develop, the chamber can be hoisted on to the deck of the diving ship and the remaining decompression carried out in safety.

Should a case of compressed air illness develop, the treatment consists of immediate and adequate recompression—either in a recompression chamber or by sending the diver down again.

The Psychology of Deep Diving

One of the problems which confronted the 1930 Admiralty Committee was the occurrence in divers of a sensation variously described as dizziness, faintness, or semi-loss of consciousness. These sensations occurred at depths beyond 200 feet, and one of the disconcerting features of them was that the diver continued to answer signals and even speak on the telephone, yet when he reached the submerged decompression chamber he could recall nothing of what had happened in deep water. At this time the divers were in complete darkness at depths of over 200 feet, and as balance is largely a matter of co-operation between the eyes and semicircular canals, it was decided to lower a light to assist the diver. For this purpose a 3,000 candle-power lamp was used, and did improve matters, but a few cases still occurred. Carbon dioxide and oxygen poisoning having been excluded as causal agents, and the fact that some men were more prone to be affected than others suggested that the condition was more psychological than physical, a speculation which was supported by the fact that certain divers showed a steady improvement as the diving trials proceeded.

Some of the affected divers were examined by Professor Millais Culpin, who considered that during these periods of semiconsciousness they were actually in a state of fugue. During the interview the so-called periods of semiconsciousness were reconstructed by the divers themselves, suggesting that in actual fact there was no loss of consciousness at all, and that the state was a form of terror which caused the memory of events during the period to be suppressed. As a result of these findings the committee recommended that "tendencies to phobias should be treated with suspicion, and any sign of claustrophobia should debar a man from deep diving"[11] (p. 159). "The type of man likely to be suitable for deep diving is the strongly built athletic type of even temperament"[11] (p. 10). Two successive sets of diving trials have confirmed these recommendations, in that their adoption has been followed by a disappearance of such a state of affairs.

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Clinical Memoranda

A Second (Fatal) Attack of Scarlet Fever with Haematemesis

This case is an example of the now rarely seen haemorrhagic type of scarlet fever, with the unusual complication of haematemesis. Permission for post-mortem examination was not obtainable, but it is fair to assume that the haematemesis was the result of bleeding from petechiae in the gastric mucosa. Incontinence prevented a complete analysis of urine, but one specimen examined showed only albuminuria and no blood.

The second unusual feature is the occurrence of two attacks of scarlet fever in the same child within four months; the first, a mild infection easily resisted; the second, a severe infection with almost no response from the patient. This is a curious example either of great variation in immunity or of alteration in the virulence of the infection. No other case of similar type was encountered during the same epidemic period.

CASE HISTORY

A female, aged 7 years, was admitted to Stockport Isolation Hospital late in the course of scarlet fever. The onset had been sudden with headache, vomiting, fever, and sore throat, and the rash appeared after the first twenty-four hours, an intense generalized punctate erythema with petechiae. A thick, rapidly forming exudate soon covered the fauces, and was so membranous in character that swabs were taken to eliminate the possibility of an infection with Klebs-Loeffler bacilli. These were negative.

There had been a previous attack of scarlet fever four months previously, and this, though of a milder type, was quite definite—headache, vomiting, sore throat, and rash. A twin sister to the patient was infected at the same time and both desquamated.

The condition of the child on admission to hospital on the seventeenth day of the disease closely resembled the typhoidal state—emaciation and pallor with oedematous lips, stupor, hot dry skin, and double incontinence; temperature 104.2°, pulse 144, the heart sounds feeble, but no bruits. A few moist rales were heard at the lung bases, and the edges of the liver and spleen were palpable through the thin abdominal wall. These were the general signs associated with a scarlatinal infection of very severe type. The trunk was covered with a coarse cyanotic rash, with punctate, petechial, and blotchy macular elements confused, and with desquamation present in parts, chiefly on the sides of the thorax and upper arms. The fauces were injected, and there was evidence of

recent areas of superficial ulceration and sloughing, but no fresh exudate. There was copious purulent post-nasal discharge and slight epistaxis. Petechiae were present in the buccal mucous membrane. The tongue was stripped, with oedematous red papillae. In spite of the degree of faucial inflammation the cervical glands were only very slightly enlarged. There was bilateral otitis media, which had been present since the tenth day of the disease, but no mastoid involvement.

Treatment.—Forty c.cm. of scarlet fever antitoxin intramuscularly, glucose and salines, stimulants and oral hygiene.

The condition improved slightly up to the third day in hospital without marked alteration in the physical signs. On the evening of the fourth day the child collapsed and vomited about half a pint of stomach contents mixed with fresh blood. A second haematemesis occurred about ten minutes later, and was followed almost immediately by death.

J. H. F. PANKHURST,
M.D., B.Hy., D.P.H.
Stockport.

Developmental Defect of Vagina

The following case, which came to my notice at my child welfare and maternity clinic, may be of interest to readers of the *Journal*.

A small Mussulman woman of 16 years came for consultation on account of sterility during her four years of married life. She told me that she had tried a number of hakim's cures and charms, but without success, and as her husband was talking seriously of sending her back to her village and having nothing further to do with her, she could see nothing for it but to let me examine her. She had menstruated normally, without undue pain, since the age of 10. No other history could be got.

She was very small of stature, with alar thorax, undeveloped breasts, narrow hips, and a hacking cough. Her weight was 50 lb. exactly. The teeth were badly discoloured with pan (the leaf they chew) and the breath bad; the tongue was furred. The neck showed nothing abnormal. The chest moved badly on respiration, particularly on the right side. Crepitations were present in both apices, together with a small cavity in the right apex towards the front. The abdomen yielded nothing abnormal. The pelvis was small, the measurements being: intercristal, 8 in.; interspinous, 7½ in.; antero-posterior, 5¾ in. On examining the perineum a child-like vulva was found, but no sign of the anus! When the lips of the vulva were drawn apart the urethra was plainly seen in the normal position; the vaginal opening, too, was clear. There was, however, in the position of the posterior fourchette and perineal body a pouting mass of mucous membrane, pink in colour and the size of a hazel nut—that is, half an inch across. This mass pointed forwards and downwards. When the finger was inserted in the normal way to perform the vaginal examination it was found that unless the anterior wall of the vagina was followed the rectum was attained. The posterior wall of the vagina was represented by a fine membrane, which by the feel of it when taken between a finger in the rectum and another in the vagina, could have only been of the thickness of the two mucous membranes plus a common submucosa. Thus the rectum opened entirely within the vulva. The anal sphincters were of firm consistence posteriorly, but missing in front, of course. The cervix was virgin, the uterus small and anteverted; the ovaries were normal in position and size as far as could be made out.

I have no literature at hand which details the anomalies of development of the urorectal septum of the foetus. I wonder if the condition is very common or not. I have never seen this abnormality before. Imperforate vagina is frequently seen out here in varying degrees. The sterility in this case appears to me to be probably due to conjugation taking place in the rectum instead of the vagina. After very close questioning of the woman and her husband the history of incontinence of faeces was obtained. No history of an abscess in this region could be obtained, and, in any case, there were no signs of previous sepsis in the region concerned.

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Reviews

DISEASES OF CHILDREN

Professor M. G. PETERMAN, with the help of twenty-one American colleagues, has carried out the translation into English of the fourth German edition of *The Diseases of Children*,[1] edited by Professor M. PFAUNDLER and the late Professor A. SCHLOSSMANN, and in so doing has earned the gratitude of all those whose work is with the health of the child. Ever since it first appeared in 1906, as the production of a young and enthusiastic band of German-speaking paediatricians, the great "Pfaundler-Schlossmann" has been regarded as a reference work of the first rank and well representative of that school of paediatrics which has trained, in part at any rate, so many of the present-day practitioners of this branch of medicine on both sides of the Atlantic. The translation is in five volumes, running into nearly three thousand pages in all. The style of printing and production is excellent, and there are more than a thousand illustrations in the text as well as seventy-six full-page plates in colour or black-and-white. An index of eighty pages in the last volume appears to be complete and satisfactorily selective.

Turning to the contents the reader will look first at those sections which have been more particularly the object of special research in Germany. W. Keller and E. Moro deal with tuberculosis in a thoroughly competent manner, although the retention of the term "scrofula" is unsatisfactory, and the extension of this old-fashioned conception in such subdivisions as "torpid scrofula" or "the erethitic type of scrofula" does not make for clear understanding. Bela Schick's monograph on diphtheria is excellent, and the section on diseases of the blood by Hans Opitz provides a well-selected epitome of this big subject in one hundred pages. A new addition in the present work is a section on the tropical diseases of childhood, by C. H. Bisdom of Java. It is significant that almost the whole of the first volume and about one-sixth of the total work is occupied with the fundamental subjects—physiology and pathology—together with sections on the history of paediatrics, child welfare, the use of drugs in childhood, toxicology, and statistics of morbidity and mortality. Against this background the later sections on diseases of children are carefully built, and the result is a solid structure, well planned and well completed.

The translators have not only made an English version, but have added comments (in smaller type or in parenthesis) which are sometimes helpful but often irritating. With this small reservation there can be nothing but praise for this important publication.

THE RETICULO-ENDOTHELIAL SYSTEM

The reticulo-endothelial system is a comparatively new field of physiological and pathological research, and, although much has been written on it, it is probable that conceptions as to its nature and functions are in general somewhat vague, except among those who make it a special study. With the aid of Dr. Du Bois's monograph on the subject[2] the reader should have no difficulty in obtaining a clear idea of the system, enabling him to link it up satisfactorily with his previous pathological knowledge. The reticulo-endothelial system is a part of the general connective tissue of the body. To within

[1] *The Diseases of Children.* Edited by Dr. M. Pfaundler and Dr. A. Schlossmann. English translation edited by M. G. Peterman, Sc.B., A.M., M.D. In five volumes. Philadelphia and London: J. B. Lippincott Company. 1935. (1,129 figures, 79 in colour; 76 plates. £9 9s. the set.)

[2] *Physiologie et Physiopathologie du Système Reticulo-Endothelial.* By Albert H. Du Bois. Paris: Masson et Cie. 1934. (Pp. 204. 36 fr.)

a few years ago the latter was regarded merely as a mechanical supporting framework of the tissues and organs. When, however, the part played by it in the production of oedema was recognized, this view became modified, and it and its associated endothelium came to be regarded as a definite organ. The function of certain of its cells as phagocytes had long been known, and the tissue derives special importance from the fact that it occupies a position as a barrier interposed between the circulating medium and the parenchyma of the organs, across which the exchange of materials between the blood and the organ-cells takes place. Particular substances, such as carmine, Indian ink, and micro-organisms, when injected into the circulation, are arrested and fixed by certain cells of this connective-tissue–endothelial barrier, and the fixation occurs in varying degrees in different regions. For example, perfusion experiments on isolated organs with an emulsion of micro-organisms have shown that the liver arrests about 80 per cent. of the microbes, the spleen 60 per cent., the lungs 6 per cent., the intestine 4 per cent., and the brain and membranes 0.5 per cent. The entire system has been called the reticulo-endothelial system "in the extended sense," while those territories in which the fixation or phagocytosis is especially active—namely, the liver, spleen, bone marrow, and lymphatic glands—are grouped together under the term reticulo-endothelial system "in the restricted sense."

Dr. Du Bois's book deals, in order, with the morphology of the system, the process of fixation, the relation between the system and the blood corpuscles, the tests of the functional activity of the system, and its influence in the intermediate metabolism of physiological pigments, lipoids, and carbohydrates. It also discusses the action of the system in infective diseases and intoxications, and in therapeutics. The book ends with a comprehensive bibliography, consisting of thirty closely printed pages of references.

SPEECH IN CHILDHOOD

The authors of *Speech in Childhood*[3] have combined to produce a book of which the purpose is not perfectly clear, although the public to whom it is directed presumably consists of teachers in clinics for disorders of speech, educational officers, neurologists, psychologists, otologists, laryngologists, physicians interested in the disorders of children, and perhaps also parents in general. All these will find in some of its twelve chapters food for reflection, practical guidance, and copious information. Yet the teacher will find a lack of practical detail, the surgeon will find the anatomy and physiology of the popular variety, the neurologist will find the neurology elementary, and if parents attempt it they will be overwhelmed by the metaphysics. The book contains a good general account of the mechanism, development, and disorders of speech, with an outline of how the last should be treated, and the authors, Dr. George Seth, a psychologist, and Dr. Douglas Guthrie, a laryngologist, have done poor service to their excellent work by encrusting it with this extraneous coating of physiology and metaphysical speculation. The account of speech-sounds and the international phonetic alphabet represents the basic portion of the work, and it may be that the two authors, approaching the subject from a different standpoint, have amplified it by chapters which do not blend very readily. However, they have made a gallant effort to produce a comprehensive book on a subject which has been much neglected in spite of the modern wave of enthusiasm for education. The proper development of speech in the broadest sense lies at the back of all successful educational effort, and although this book as a whole will interest few, its various parts will appeal in different ways to a large circle.

[3] *Speech in Childhood. Its Development and Disorders.* By George Seth, M.A., Ph.D., and Douglas Guthrie, M.D., F.R.C.S.Ed., F.R.S.E. London: H. Milford, Oxford University Press. 1935. (Pp. 224; 46 figures. 10s. 6d. net.)

BIRTH CONTROL ONCE MORE

We are always hoping to read a book on birth control—or, more properly, the control of conception—which presents the case in its favour with logic, moderation, adequate appreciation of the many relevant questions of population and sociology, and with due respect for opposing views. Unhappily, though there are, of course, varying degrees of merit in existing publications, the hope still seems vain, and a recent volume entitled *Birth Control and its Opponents*[4] does not really differ from the general ruck. Its author, Dr. F. W. White, says in his preface that thirteen years ago he resolved to "tackle these problems of slums and war," and to "probe down unflinchingly to root causes"; that thereupon he began to read Darwin's *Origin of Species* and the works of many other authors which are the familiar mental possessions of most educated persons; and that "this little volume attempts to present, in simple terms, some of the results of my journeyings in search of truth." Such a prolonged and earnest study by a busy man is commendable and the result deserves attention and respect, but unfortunately this does not reveal any deeper understanding of the subject than appears in most of the recent literature.

Dr. White begins with the proposition that this is a very imperfect world, and demonstrates its truth. He shrinks, however, from the conclusion that the world should no longer be peopled, and ignores every possibility but one of making it better. The one means of improvement, apparently, is to diminish the human species by allowing its recruitment only from those who accidentally—or, in a few cases, designedly—escape the universal application of measures of birth control. This general line of argument is based on two assumptions: first, that the world has rapidly become overpopulated within the last hundred years or so and that this process is continuing, and, secondly, that food supply is insufficient for the population. Neither of these assumptions is valid, at any rate so far as Western civilization is concerned. It is demonstrable that the application of scientific methods to agriculture would result in food production sufficient for the needs of many times the present population of the world, even if not a single acre of fresh cultivation were added; and the present fertility rate (as distinguished from calculations based on the crude birth rates and death rates, on which Dr. White still relies) of the white races forecasts a rapid decrease of population within the next two or three generations. If this occurs the problem before our grandchildren will be that of under-population. Even with the Eastern races—Indians, Chinese, and Japanese—with regard to whom Dr. White very properly says that it would be better to reduce their numbers by birth control rather than to rely for this purpose on the effects of earthquake, flood, and typhoon—it cannot confidently be predicted that these natural phenomena would cease because the population was fewer.

In dealing with differential fertility as between social classes in this and other countries, Dr. White makes the two common mistakes of exaggerating these differences and of postulating that the offspring of poorer persons are necessarily, on the whole, inherently inferior to those of the more comfortably situated classes. The latter assump-

[4] *Birth Control and its Opponents.* By Frank W. White, L.R.C.P. and S.E. With foreword by Lord Horder, M.D. London: John Bale, Sons and Danielsson, Ltd. 1935. (Pp. 164. 3s. 6d.)

tion still awaits proof. The latest statistics now show, moreover, that the fertility rate of the poorer classes is falling rather rapidly in many countries to the same level as that of other classes, and that in Stockholm, for instance, it has already reached that level. It becomes plainer every year that, so far as eugenic measures are concerned, it is much more important to encourage breeding from the more satisfactory stocks (wherever they are found) than to discourage or prevent the birth of normal children among the population in general.

It need not be disputed that appropriate measures for conception control, and permissive measures for voluntary sterilization in a limited class of case, have their place in the medical and in the social sphere, but to claim them as panaceas for social ills seems absurd. Yet Dr. White, as is common, does it. He says that birth control "ranks as one of the greatest human discoveries, on a par with, if not of even vaster moment than, those of fire and printing: it is the one essential needed to render man really superior to the rest of living creatures." He puts it forward as the one remedy for war, unemployment, and maternal mortality; and claims that "those who take the trouble to practise it wisely will certainly experience the moral exhilaration of having fulfilled a social obligation." The opponents he classifies rather unkindly. He then sets out some of the arguments against birth control in a way which makes it relatively easy to meet them. The real difficulties escape him. Yet his book is put together in an interesting way. Though somewhat crude, it is not ineffective, but the wary reader will note the careful selection of facts and opinions quoted from a considerable number of other writers, not all of any great authority.

SURGERY OF THE SHOULDER-JOINT

L'Épaule,[5] by ANTOINE BASSET and JACQUES MIALARET, forms one of a series of monographs on the surgery of the joints. It begins with a detailed description of the external appearances of the shoulder and of its normal anatomy, illustrated by excellent radiographs, by anatomical drawings of the joint and its relations, and *x*-ray photographs of injected specimens of the joint and the arteries around it. This is followed by a discussion of the methods of access to the joint illustrated by sketches whose appositeness and neatness are typically French. Among these we might specially mention the approach from above by division of the acromion and clavicle, which deserves far more attention than it has received.

Short articles on suppuration in the shoulder-joint, on resection, and on the treatment of fractures in this region are followed by a very full description of the treatment of dislocation, both traumatic and pathological, very fully illustrated with admirable drawings. There follow articles on arthrodesis, tuberculosis, and flail joints and ankylosis, and the volume concludes with a full description of amputations in this region. It will be useful as a work of reference, and it is well worthy of study, if only for the beauty of its illustrations.

ENDOCRINOLOGY

The second edition of *Recent Advances in Endocrinology*[6] by Professor A. T. CAMERON, has appeared only two years after the first one, but this subject is moving so rapidly that the volume under review contains a large amount of new information, and the author states that alterations have been called for in every chapter. In particular, the treatment of diabetes, the nature of the ovarian hormones and the functions of the pituitary gland are subjects in which extensive advances in knowledge have occurred. A feature of this volume of particular interest to medical practitioners is that special attention is paid to advances in endocrine therapy, and a full and completely up-to-date account is given of such important practical problems as the results of iodine administration in Graves's disease, and the effects of high carbohydrate diet in diabetes mellitus. At the same time a cautious and critical account is given of certain subjects in which the evidence is still conflicting, such, for example, as the effects of ovarian and testicular therapy.

It is common knowledge that endocrinology is advancing at a great rate, but that the literature is of overwhelming bulk and extremely contradictory. Professor Cameron's book will be found of great value to all who need a guide in this difficult field of medical science and practice.

[5] *L'Épaule: Anatomie des Formes Extérieures; Anatomie Radiographique; Chirurgie Opératoire.* By Antoine Basset and Jacques Mialaret. Paris: Masson et Cie. (Pp. 292; 116 figures. 65 fr.)

[6] *Recent Advances in Endocrinology.* By A. T. Cameron, M.A., D.Sc., F.I.C., F.R.S.C. Second edition. London: J. and A. Churchill. 1935. (Pp. 406; 55 figures, 2 plates. 15s.)

Notes on Books

The holiday season is at hand, and we must take this opportunity of recommending Dr. H. H. BASHFORD'S latest book of essays to readers who like something more provocative of thought than the thriller. *Lodgings for Twelve* (Constable, 7s. 6d.) is a good thing to put in the suitcase for idle moments. Dr. Bashford needs no introduction to a medical audience. He knows how to write and has the knack of "putting across" a personality or a domestic interior. His gift for clear-cut character drawing in episodal form has improved with practice, and the discerning reader will find more than mere entertainment in these homely essays, with their agreeable blend of autiobiography and objective reminiscence. One or two of them are scenes of medical life in the reign of King Edward VII.

Human Sterilization To-day[7] is the work of a keen student who is convinced of the value of sterilization for certain conditions, but who was determined to examine for herself its own intrinsic worth and travelled to America and the Continent in so doing. After brief introductory chapters describing technicalities for the untrained reader, Mrs. HODSON proceeds to a detailed description of the present position in those countries that have legalized sterilization. She visited many of the countries concerned, so that the food she gives us is not only palatable but nutritious. In turn, the conditions and results of sterilization are described in the United States, Denmark, Switzerland, and Germany. References are also made to sterilization in Alberta, British Columbia, Ontario, Sweden, Norway, and Finland. Finally, a short chapter is devoted to sterilization in England. The Brock report is described, and questions of progress are discussed in further chapters.

A little book on the blood and blood-forming organs, *Sang et Organes Hémopoïetiques*, by Dr. A. TOURAINE, (Paris: Masson et Cie, 30 fr.), is one of a series of introductions to medicine published under the direction of Dr. A. Sézary. The descriptions of the blood cells and of the bone marrow and spleen have been compiled from the orthodox teaching and are sufficient for the student's purpose. In another edition it would be well to modernize some of the normal standards. The normal limits for red cell count according to recent observers is 4.5 to 6.4 millions per c.mm., and haemoglobin percentage varies in health from 90 to 123 (12.4 to 17 grams). The technique recommended for estimating the amount of haemoglobin is over forty years old; Gower's haemoglobinometer is not used to-day; and surely a black-and-white representation of Tallqvist's strips of coloured blotting paper is not very useful, even if the method could claim any approximation to accuracy. The sections on clinical haematology are not well arranged, and involve much

[7] *Human Sterilization To-Day.* A Survey of the Present Position. By Cora B. S. Hodson, F.L.S. Forum Series No. 19. London: Watts and Co. (7d. net.)

unnecessary repetition. In the account of pernicious anaemia the essential presence of achylia or hypochlorhydria is not mentioned, nor is there any reference to the nature and value of the reticulocyte reaction after liver therapy. The coloured plate of red cells and leucocytes will be useful for the beginner in the laboratory; reticulocytes are not included in the plate. There would be no demand for this book in this country, where there is a plethora of better and more up-to-date guides to haematology.

Mr. CONRAD TRELAWNEY FITZ-GERALD, in the book which he has called *The "Albatross,"*[8] tells of the life of his grandfather, who, at an advanced age, still enjoys his health—and long may he continue to do so. Born in 1847, at Marlborough, he qualified from the Bristol medical school, made a couple of uneventful voyages to Melbourne as a ship surgeon, and then settled at Harbour Breton in Newfoundland. Here he built the *Albatross* in 1873, and for more than forty years did the greater part of his widely scattered practice in her. Usually he sailed her himself; sometimes he had a hand to help him. The fees were not excessive—four dollars for each family, paid in fish value to the firm of Newman, Hunt and Co., who, in turn, converted the fish into cash. But if the reward was meagre the excitement of the life and the roughing of it more than made up. Dr. Fitz-Gerald loved the sea. His hairbreadth escapes and his moving accidents by flood and field captivated Miss K. Partridge, who, as Mrs. Fitz-Gerald, still shares their memories and many others with her husband. The whole story is well told, and the book is illustrated with portraits.

Mr. F. N. PICKETT, the author of *Don't be Afraid of Poison Gas*,[9] had exceptional practical experience of the subject when employed in the destruction of the huge dumps of gas ammunition left behind at the end of the great war. He states that the experience then gained was collected in a report which never saw the light of print, and he has therefore published this pamphlet which tells civilians what to do in the case of a gas attack. The author holds that the chief danger of a poison gas attack on a city lies in the fear that the smell of gas inspires, and his chief theme is that, given reasonable intelligence, "there is nothing to fear except panic." Like all other writers on the subject, he emphasizes the need of an adequate supply of gas masks. Other essentials for defence are stated to be chloride of lime, and rubber boots, rubber gloves, and rubber clothing.

[8] *The "Albatross." Being the Biography of Conrad Fitz-Gerald, M.R.C.S., L.S.A., 1847–1933.* Written by Conrad Trelawney Fitz-Gerald, jun. Bristol: J. W. Arrowsmith Ltd. (For private circulation.) (Pp. 208; illustrated.)

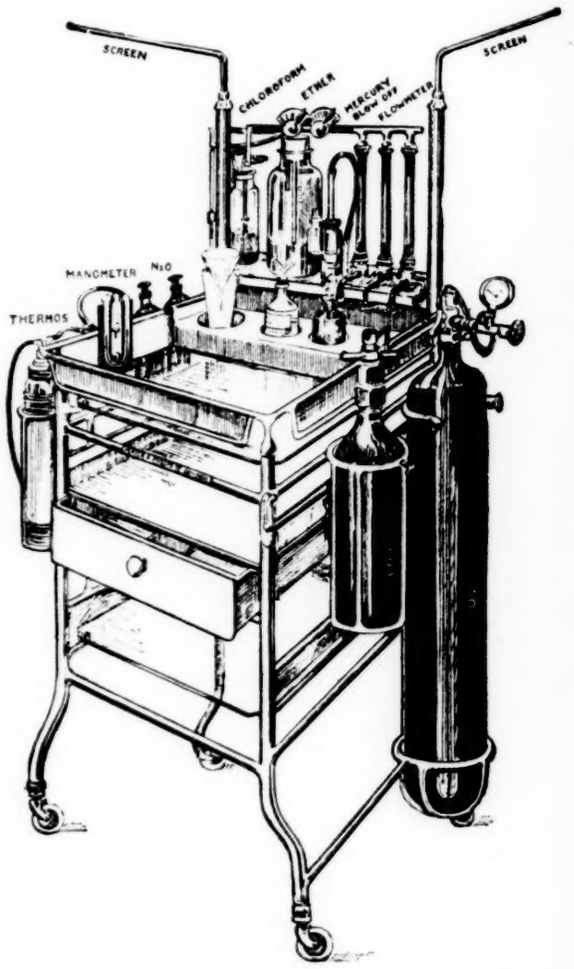
[9] *Don't be Afraid of Poison Gas. Hints for Civilians in the Event of a Poison Gas Attack.* By F. N. Pickett, M.I.M.E., A.M.I.E.E. London: Simpkin Marshall Ltd. 1934. (Pp. 41. 1s. net.)

Preparations and Appliances

AN ANAESTHETIC TABLE

Dr. H. GORDON GREAVES (honorary anaesthetist, Cardiff Royal Infirmary) writes: Some time ago I was imbued with the idea of an anaesthetic table designed for hospital use which would embody in one unit facilities for practically all methods of modern inhalation anaesthetics. Considering that most modern tables are too complicated, with valves, rubber tubings, and pressure gauges, for use by any but skilled anaesthetists, who must also be expert mechanics, I have endeavoured to evolve one that is both simple, foolproof, and efficient. This I have contrived to do by the use of a very modified Rowling's table, an improved wide-bore Shipway's warm ether and chloroform apparatus, and a Boyle's gas, ether, and oxygen apparatus; the last two can be used separately or in combination with one another.

The table, which is mounted on large ball-bearing castors, has straddled legs to increase its stability. On the top shelf are fitted the flow-meter, mercury "blow-off," and Shipway's wide-bore ether and chloroform apparatus. The accommodation for the cylinders is on either side of the table—on the one side a 40-ft. oxygen and a 4-lb. CO_2 cylinder, and on the other, two 200-gallon N_2O cylinders with a 1-quart vacuum flask. Rubber tubing is reduced to a minimum by the use of wide-bore metal tubing permanently fixed to the table to connect the flow-meter with the various gas cylinders, and also to connect the three-way junction of the Shipway's apparatus to the vacuum flask. There is a mercury "blow-off" and a manometer, which cater adequately for intratracheal administration. These are connected in a like manner to the patient's delivery tube. The only rubber tubing is in the form of short junction pieces. Across the top, in front of the apparatus, a rack is provided to hold anaesthetic bottles, etc.; and a metal shelf or basket is fitted at the back of the table to hold gas-cylinder keys, metal parts, etc. There are three shelves for



accommodation of all necessary masks and instruments, on the sides and back of which are guards, which prevent instruments, etc., from falling off the table. A full-sized drawer, four inches deep, with a compartment for all emergency hypodermic drugs, etc., is provided, and one or two hooks on the uprights are included for hanging up a gas-bag, stethoscope, etc.

In conclusion, I would like to say that the table has been in full use for the last four months, and has so far proved itself completely satisfactory in every way. Both junior house-men and nurses understand it after two or three minutes' exploration or explanation. I am indebted to all those anaesthetists for the various parts used from Dr. Rowling's table, to Sir Francis Shipway for his apparatus, to Mr. Boyle for his. My thanks are also due to Messrs. Mayer and Phelps Ltd. for their interest, help, and experience, and for the work done by the firm in making the finished article; and last, but not least, to their Mr. Davis, who has been in constant consultation with me over the hundred-and-one small details. The table was made for the Cardiff Royal Infirmary, to whose management I offer my grateful thanks for making its production possible.

British Medical Journal

SATURDAY, AUGUST 3rd, 1935

GASTRITIS AND ITS CONSEQUENCES

There are few diseases which have passed through such diverse phases as gastritis. Beaumont in 1833 had demonstrated on his patient with gastric fistula two distinct kinds of inflammation of the wall of the stomach, one following over-indulgence in alcohol and the other in a febrile attack which we would now call influenza. These excellent clinical observations were forgotten during the period when pathological anatomy was used as the basis of medicine, since lesions which might have kept pathologists aware of the results of gastric inflammation were obscured by the autodigestion which occurs readily post mortem. While the pathologists were led off into side issues by polemics about interpretation, a new method of investigation was introduced by Ewald and Boas in the biochemical testing of the gastric contents obtained by vomiting or by tubage of the stomach. Since there was no control from the side of pathology, a purely empirical classification of gastric disease was taught, based upon the varying acidity and motility of the stomach, all being described as forms of nervous dyspepsia. The genius of Moynihan discovered in one group of such cases—those with hyperchlorhydria and a tendency to pain when the stomach was empty—an underlying cause in the frequent occurrence of duodenal ulcer. Advances in radiology enabled the contour of the stomach to be shown on fluorescent screen and sensitive film, and soon it became possible to demonstrate characteristic appearances in cases of gastric and duodenal ulcer. With further improvement of technique the pattern of the folds of gastric and duodenal mucous membrane in the neighbourhood of these lesions was noted and inferences were drawn not only as to the puckering and scarring that takes place, but also as to the thickness or atrophy of the mucous membrane as a whole. The recent introduction of methods of directly bringing the gastric mucous membrane into view by means of the gastroscope confirmed and enlarged these findings. Meanwhile gastric surgery has given opportunities of direct examination of the condition of portions of stomach wall removed and fixed as fresh as possible. A modern gastro-enterologist writes, "Every dyspeptic suffers from gastritis" (Henning). In the century, therefore, the clinical appreciation of inflammation of the lining wall of the stomach as the basis of the symptoms has come full circle.

Due respect must be paid to one who, in all this turmoil of dispute and conflicting views, has for forty years consistently held that, far from being a diagnosis which might be ignored in daily practice, gastritis is to be recognized as one of the commonest human diseases. And this was no unsupported opinion. Professor Knud Faber studied the pathological anatomy of the stomach as part of a research on the digestive organs which began in 1898. In order to eliminate post-mortem changes, quantities of 4 per cent. formaldehyde solution were injected into the abdomen immediately after death, thus securing fixation *in situ*. The information obtainable by this method of investigation is very valuable, the mucous membranes being excellently suited to microscopical examination. Since that time Faber and his colleagues have tried to convince the medical world of the significance of chronic gastritis, but till the last decade their views found little acceptance outside the Scandinavian countries. In a series of lectures delivered at Guy's Hospital last year and now published in an amplified form Professor Faber places on record his considered views on gastritis and its consequences.[1]

After a short description of the normal gastric mucous membrane, Faber deals with the appearances in acute gastritis, differentiating an irritative (for example, alcoholic) gastritis from a haematogenous form occurring in the course of diphtheria, influenza, and other fevers. In the former there is at first hypersecretion of gastric juice and mucus; after recurrent attacks there may be decrease to anacidity, but the condition is recoverable at first with treatment. The haematogenous form, a pan-gastritis, quickly causes achylia. Similarly chronic gastritis is found in two forms: a chronic erosive gastritis, especially localized in the pyloric antrum, which may become ulcerative; and a diffuse pan-gastritis, which tends towards atrophy. While the latter may produce few or no symptoms, the forms of gastritis with hyperacidity may have symptoms for years resembling those regarded as characteristic of duodenal or pyloric ulcer—hunger pains, even haemorrhage, and high-climbing curves of hyperacid gastric juice—without ulcer being demonstrable. In these cases it is difficult on the data as yet available to decide if the gastritis precedes the ulceration or if it occurs in the surrounding mucous membrane owing to the presence of the ulcer. Faber believes that the disease which leads to chronic ulcer in the first instance must be a gastritis or a gastro-duodenitis which is subacute—or, rather, chronic with acute periods—and that this gastro-duodenitis gives rise to erosions, sometimes to small acute ulcers, and at last to chronic ulcers, which are the most important link in the development for the patient. Other careful observers are of opinion that chronic ulcers are formed in a different way, and that the gastritis is secondary to the ulcer. Faber holds that gastritis is closely related to anacidity. A functional anacidity may be present without anatomical changes in certain instances owing to nervous influences, but this is only transitory. Of greater importance is the cessation of acid secretion caused by toxins without gastric changes, as in thyrotoxicosis, and in certain alimentary diseases, beri-beri, pellagra, and deprivation of B vitamins. But in most

[1] *Gastritis and Its Consequences.* By Knud Faber, M.D. London: H. Milford, Oxford University Press. (8s. 6d.)

cases the anacidity, even without symptoms, is a residue of previous gastritis. The number of cases naturally increases with age. Its importance is recognized in the known relationship to pernicious anaemia and gastric carcinoma.

Gastritis has come into the foreground of medical thought at the present time. It is the subject of discussion at the first International Congress of Gastroenterology, which is to be held in Brussels early this month. In a few days from now medical men the world over will contribute to and learn from the interchange of views on the problems of gastritis and its often fatal consequences.

SHORT-WAVE THERAPY

Few references to this treatment have been made in our columns during the past two years, apart from the report of a relevant discussion at the Royal Society of Medicine in 1934, the subsequent correspondence, a brief book review,[1] an account of the physics of high-frequency currents discussed at a recent meeting of the Duchenne Society for the Advancement of Electrotherapy,[2] and a record of its employment for induced pyrexia in syphilis.[3] Short-wave therapy has attracted much interest in both lay and specialist journals, and the time seems ripe for a short review of the subject. During the nine years or so of its development the treatment has left in its wake an unattractive confusion of terminology—short-wave diathermy, radiothermy, radiathermy, parathermy, ultra-diathermy, and inductothermy being some of the expressions that have been coined.

To come at once to the point, so-called short-wave therapy employs electromagnetic radiations of a wave-length varying from 3 to 30 metres, the term "ultra-short-wave therapy" being customary when waves from 3 to 12 metres are used. The electromagnetic spectrum ranges from the cosmic rays (the shortest) through the gamma rays of radium, *x* rays, ultra-violet light, solar light, infra-red rays, and the Hertzian waves down to the short and finally the long wireless waves (the longest). The "short waves" under discussion comprise some of the longer Hertzian waves and short wireless waves, and consequently are low down in the electromagnetic scale. In wireless terminology the "long" wave-length varies from 100 to 1,000 metres, the "short" from 10 to 30—the diathermy wave comes in the former category, being in the region of 300 metres. The application to therapeutics of the short waves we are dealing with has been made possible by knowledge of wireless transmission. It has entailed the manufacture of instruments which are powerful enough both to generate waves of the desired frequency (between 10 and 100 million oscillations per second) and to provide enough energy behind them to raise the temperature of the body tissues when the patient is placed in their field.

Broadly speaking, the principles and technique of application of diathermy and short-wave therapy are somewhat alike; in the latter, however, the patient is not in direct contact with the conductor plates, but is placed in the condenser field charged by the electric oscillator. In short-wave therapy the electrodes are almost always separated from the body by insulating material which maintains them at a distance of from 1/2 to 2 inches from the skin. Uncertainty seems still to exist about the exact mode of action of short waves. A specific effect is claimed on colloids, and an inhibitory and sometimes lethal effect on bacteria: these effects are said to be independent of the production of local or general heat—the most obvious change—and to be one of the most important features distinguishing short-wave therapy from diathermy. Further differences between the two are that in the former a more uniform and deeper heating is obtained, and that the 3 to 12 metre range of short-wave therapy exerts (so it is claimed) a "selective effect" varying with the wave-length. The 12 to 30 metre range can be used in both general and local heating, as in diathermy. A considerable literature has sprung up concerning the biological and pathological effects of short-wave therapy. The results are in many cases inconclusive, and much work has still to be done before the treatment can be established on a scientific basis; apparatus has not yet been standardized, and certain manufacturers have advanced extravagant therapeutic claims. Dosage forms a distinct difficulty, because the heat sensation of the patient is the only guide as to the degree of radiation which he is receiving.

The originator of short-wave therapy, Dr. Erwin Schliephake, has reported the most astonishingly successful results in inflammatory processes—especially in the acute stage—and the indications for the treatment extend to an almost endless number of morbid states. (For details the reader is referred to Dr. Schliephake's book.[4]) He even goes so far as to assert that we may one day reach the point of being able to select the optimal wave-length and apply it to every disease and every micro-organism. Furunculosis, acute empyema of the nasal sinuses, pleural empyema, and pulmonary abscess are some of the conditions which have been successfully treated. If this observer's results can be confirmed short-wave therapy promises to be a measure of extreme value; but it is too early to assess the value of a treatment which is still in the experimental stage, and whose application appears to be casual, difficult, and not free from danger: it has been shown by animal experiments that it is possible almost to "cook" internal organs without at first producing gross changes in the overlying skin. Physicians of a critical habit of mind using the method in this country have found that although it gives better results than any previous physical method, dosage and technique are most

[1] *British Medical Journal*, 1935, i, 156.
[2] Ibid., 1935, i, 848.
[3] Ibid., 1933, i, 706.
[4] Schliephake, E.: *Short Wave Therapy*. The Actinic Press, 1935.

important, and adverse clinical effects may easily follow injudicious applications.

In April last the American Medical Association's Council of Physical Therapy issued an authorized statement on short-wave therapy[5] so clear and concise that it will repay any practitioner desirous of prescribing this form of treatment to read the full report. A few quotations may be of interest. The report states:

> Extravagant therapeutic claims have been put forward, based largely on the writings of Dr. Erwin Schliephake . . . whose assertions have been not only unconfirmed in this country but also partially refuted on the Continent. For example, with a co-worker, Haase, he reported a selective lethal action on various micro-organisms *in vitro* with specific wave-lengths of short radio waves, whereas Hasche and Leunig exposed cultures of staphylococci and streptococci in distilled water, saline solution, bouillon, milk, and on agar plates, to ultra-short waves of different frequencies and intensities for periods of time up to eight and a half hours, and they observed no inhibitory or destructive effect on the bacteria. They concluded that ultra-short waves exhibit no selective temperature or electromagnetic effects on bacteria *in vitro*. . . . Schliephake has made such extraordinary claims as the following: "I have treated many hundreds of furuncles, even large carbuncles, on every possible part of the body, as well as hidradenitis, panaritium, tenosynovitis, etc., and I am able to state that ultra-short-wave therapy has not failed in a single case. The average time of cure was four and a half days, and no patient required an incision or any other operation."

In conclusion, the American Council of Physical Therapy makes a number of excellent recommendations, including the following:

> It would seem that with further study by physicists and engineers concerning the proper methods of constructing apparatus, and with further clinical investigation by especially skilled physicians in hospital physical therapy clinics, short-wave diathermy may prove to be a useful therapeutic agent. But at the present time many of these devices have not been sufficiently perfected, and it must be confessed that knowledge of the exact physiological effects of these waves is very limited. Extensive employment of these machines at the present time can lead only to unsatisfactory results, and may cause condemnation of a method of treatment that might otherwise be found serviceable.

We are in complete accord with the sentiments expressed in the last passage, and they seem to us to raise a point of much importance. It would be of great benefit to the comparatively new science of physical medicine if there were some authoritative organization in this country similar to the American Council of Physical Therapy. To such a body, holding the confidence of the profession as the *X*-Ray and Radium Protection Committee does, all new apparatus and new claims would be submitted. This would avoid the rather haphazard methods in force at the present time, whereby manufacturers compete in selling unproved apparatus to practitioners who have no hospital clinics where they can adequately examine the claims made—a state of affairs which is against the best interests of practitioners, patients, and manufacturers alike.

[5] *Journ. Amer. Med. Assoc.*, 1935, civ, 1237.

FEVER THERAPY IN VENEREAL DISEASE

Pyrogenic or fever therapy has come so much into the limelight in the treatment of venereal disease of recent years that the appearance of a symposium on fever therapy in the *Proceedings of the Mayo Clinic* for March 27th, together with two articles on the treatment of gonorrhoea by this means appearing in the *Journal of the American Medical Association* (May 18th), is particularly apposite. Many views have been put forward in answer to the question why artificially produced fever gives such beneficial results in certain morbid conditions. Probably the most important factor is the lethal effect of high temperatures on the invading organisms ; but, in addition, it has been shown that fever favours phagocytosis, diminishes the potency of toxins, and stimulates the development of immune bodies. At different times various observers have recorded almost miraculous cures of gonorrhoea in patients who have suffered from intercurrent attacks of some acute specific fever, but it was Wagner-Jauregg in 1918 who applied the principle to the treatment of G.P.I. by malaria. The two conditions, above all, which benefit from fever therapy are parasyphilis—especially G.P.I.—and gonorrhoeal arthritis. Physical methods, such as diathermy, of raising the body temperature have been used in the treatment of G.P.I., but on the whole they do not seem to have yielded such good results as malaria therapy, so that factors other than a simple rise of temperature are probably involved. In any case there can be no question that artificially produced fever has revolutionized the treatment of G.P.I. For the various manifestations of gonorrhoea many forms of fever treatment have been devised. Local heating—if possible beyond the thermal death-point of the gonococcus—has been carried out in the urethra and its adnexa by means of water-heated or electrically heated instruments and by diathermy applied to the affected part. A general raising of the patient's temperature has been accomplished by various means, such as the intramuscular or intravenous injection of vaccines of the colityphoid group, of proteins such as milk, and more recently of Dmelcos vaccine: these therapeutic measures often produce remarkable results in gonorrhoeal arthritis. In the articles mentioned above Hench and Slocumb report a series of cases of gonorrhoeal arthritis treated by enclosing their patients in the hypertherm chamber of Simpson and Kettering at a temperature of 106°–107° F. for five to eight hours. Cure was obtained in 88 per cent. of the acute cases and 43 per cent. of the chronic, and 29 per cent. of the latter were also considerably improved. It seems generally agreed that failure is due to insufficient height of the fever, too short a period of pyrexia, or occasionally to a particularly resistant strain of gonococcus. Stuhler treated twenty-nine cases of simple gonorrhoea by similar methods, with cure in twenty-five and improvement in four. No complications were observed in this series. On the other hand, Bierman and Horowitz treated gonorrhoea in the female by intense prolonged heating of the pelvic organs. A systemic temperature elevation to 105°–106° F. was brought about by means of pelvic diathermy and photothermy during a period of one and a half to one and three-quarter

hours. The vaginal temperature was maintained at 110°–112° F. for three and a half hours. An average of three sessions caused disappearance of gonococci in nineteen out of twenty-three cases. Contraindications to pyrotherapy are few: elderly and obese patients and those suffering from cardiovascular or pulmonary disease should not be subjected to it. Ill effects are uncommon, although the treatment is somewhat exhausting, and some patients complain of weakness and malaise, as is only to be expected. Constant skilled supervision is essential throughout the period of pyrexia. No one will deny the beneficial effect of malarial therapy on G.P.I. As regards gonorrhoea less work has been done in the matter of fever therapy, but the low thermal death-point of the gonococcus seems to hold out definite hopes of success, which would appear to depend on the possibility of devising a simple and safe method of raising the patient's temperature to the optimum point and maintaining it there for a sufficient time. Physical methods appear to be the most desirable, since with them it is easier to control the degree and duration of the pyrexia. Similarly, generalized heating of the patient's tissues is likely to prove more satisfactory than localized heating, since it ensures that all invading organisms are reached. The "Kettering hypertherm," as used in the Mayo Clinic, seems to be the best instrument devised so far, but unfortunately it is not yet on the market.

EXCRETION UROGRAPHY

It is generally agreed that intravenous urography has several advantages over retrograde pyelography, one of the most important of which is that it does not distend the pelvis and the calices. It is, however, often impugned on the ground of danger. The work of Dr. I. B. Barclay and Mr. J. B. Baird at the Selly Oak Hospital, Birmingham,[1] on 385 consecutive cases will go a long way towards establishing the safety and value of the method, not only in the elucidation of essentially urological conditions, but also in the elimination of the urinary tract from the diagnosis of many cases presenting suggestive urological symptoms. The same technique was employed in all cases. After "straight" or control films had been taken, generally in inspiration and expiration, uroselectan B was injected and skiagrams were taken at intervals of three, ten, and thirty minutes. When the concentration of dye in the pelves was slow, the investigation was extended up to twenty-four hours. The purpose of these three urograms is to eliminate errors due to ignoring the difference between the appearance of a ureter or pelvis in systole and diastole. Variations in the speed of filling may give valuable information on pathology. The three-minute film is often the most informative as regards renal function, but good concentration remaining at thirty minutes suggests an abnormality such as hydronephrosis, obstruction, infection, or oxaluria. Early tuberculosis in the kidney often gives characteristic appearances. The calix, besides showing fringing or bulbous deformity of its terminal part, may be tortuously elongated and irregular. The method has great value in urgent cases. Uroselectan was given, for instance, to a woman of 30 who was extremely ill and had a temperature of 102° F. It did not harm her, but the film indicated the need for instant operation, when a huge abscess was found. Excretion urography has also been valuable in the observation of recovery of renal function after operation. Though the authors' series included patients of all ages and some who were acutely ill, none showed any untoward effects of the injection.

[1] *Brit. Journ. Radiol.*, 1935, viii, 201.

CAMPAIGN AGAINST TUBERCULOSIS IN FRANCE

It is important that English observers of the antituberculous organization in France should recall at the very outset three factors responsible for the different aspect the tuberculosis problem assumes in that country. The mortality is over 60 per cent. higher than in England; tuberculosis, in fact, heads the list of causes of death, accounting for about 12 per cent. of the general mortality and approximately half the deaths between the ages of 20 and 40. Moreover, human contact is said to be answerable for the whole incidence, since human tuberculosis of bovine origin is considered very rare, owing to the national custom of boiling the milk. And, lastly, the general public health organization is not well developed, so that an adequate antituberculosis scheme may actually prove too cumbersome for incorporation. B. Brouardel and J. Arnauld,[1] in an interesting survey of the problem, first discuss the cost of the disease to France, based on the mortality statistics, which are generally believed to lack accuracy; in fact, they consider the tuberculosis mortality to be from 25 to 40 per cent. higher than the official figures. Dealing with the scientific principles underlying antituberculosis work the authors are somewhat uncritical in the acceptance of French views not universally admitted (such as the very high mortality among home contacts and the complete rejection of all theories of hereditary influence). On the other hand, the section on "the instruments of the antituberculosis fight" is altogether admirable for the lucid and detailed description of the desirable features of propaganda, dispensaries, tuberculosis institutions, prophylactic measures, and financial and moral assistance. Of particular interest is the reference to a mobile dispensary unit for country districts and the classification of sanatoria into "suburban" (for urgent, observation, and incurable cases, and for those requiring surgical intervention) and sanatoria "*de plaine et d'altitude.*" The second half of the book is devoted to a detailed account of the development and constitution of the organization in France, which really dates only from the great war, when the Rockefeller Foundation took a very active part in its initiation. In 1914 there were only twelve sanatoria, with 1,162 beds, and a few—mostly badly equipped—dispensaries in the whole country. The French organization differs in several respects from that in England, not only in regard to legislation and administration, but in the stress laid on prevention by B.C.G. and the removal of children from tuberculous homes. The authors' treatment of these last two measures is essentially patriotic in tone, and the figures they quote show that their use is not nearly so widespread as the publicity given to them would appear to indicate.

[1] *L'Organisation Antituberculeuse Française.* Paris: Masson et Cie. (40 fr.)

SWEDENBORG'S STUDIES OF THE BRAIN

The Swedenborg Society in London has recently brought out a second impression of *The Brain*, by Emanuel Swedenborg.[1] The first impression resulted from the labours of Dr. R. L. Tafel, who collected all Swedenborg's papers on the subject and published them in 1882. The work had gone out of print and is now republished. The papers may be looked upon as the culmination of that period of Swedenborg's life which he devoted to the study of natural sciences. They show, as do all his scientific writings, the scrupulous care with which he made himself conversant with all that was known in his day of the subject in hand. But even more do they illustrate the immense power of mind and breadth of view which he devoted to the subject. In his study of the brain he is not content with mastering the known anatomical facts. With those as his foundation he goes on to elaborate theories of function, theories which later research in many instances proved to be remarkably accurate—for example, his location of the motor areas in the cerebral cortex, and his forecast of the discovery of a central canal in the spinal cord. If the scientific reader of to-day finds in Swedenborg's reasoning on some aspects of function a vein of fancifulness, he will nevertheless be forced to admit that the whole conception is a lofty one, carried out with obvious sincerity in the desire to advance knowledge, and one which cannot but evoke admiration when it is remembered that nearly two hundred years have elapsed since the papers were written. He will find many quaintnesses in the language in which the treatise is written, but these rather enhance the interest and pleasure which a perusal will bring.

SCALENUS ANTICUS SYNDROME

The term "scalenus anticus syndrome" has been applied recently to the condition in which the nervous and vascular complications usually associated with cervical rib occur in the absence of any demonstrable bony abnormality at the root of the neck. It has long been known that compression of the brachial plexus and of the subclavian artery may be produced by the first dorsal rib, and the condition has been relieved by resection of the offending rib. In the opinion of Ochsner, Gage, and DeBakey,[2] this formidable operation is unnecessary, seeing that decompression of the plexus and artery can be obtained just as effectively, and far more simply, by excision of the lower end of the scalenus anticus muscle. This operation was first recommended by Adson and Coffey for the more usual cervical rib syndrome. Division of the muscle in cervical rib allows the plexus and artery to slide forwards and downwards, and anyone familiar with the operation will testify to the immediate and remote success of the decompression in all straightforward cases. It is not quite so clear why scalenus anticus tenotomy should be equally effective where the first rib is at fault, unless there is an abnormal elevation of the rib that can be corrected by division of the muscle. It is now affirmed that this abnormal elevation was present in each of four cases that came to operation. After division of the scalenus anticus "the first rib disappeared . . . into the depths of the wound"; though one is tempted to ask if a normal first rib would not behave in the same way. The muscle is supposed to be the chief offender, hence the new name for the syndrome. The scalenus anticus was found to be hypertrophied, spastic, and fibrotic, and it is suggested that these changes result from "irritation and stimulation of the brachial plexus, some of the fibres of which supply the scaleni." Nevertheless, the older theories cannot yet be completely discarded. Excessive dropping of the shoulders and a relatively high position of the sternum due to poor development of the abdominal recti (Todd) may well explain the predominance of this pressure syndrome in the female sex; and the occurrence of anatomical abnormalities in the lower roots of the brachial plexus (Wood Jones) probably accounts for the absence of compression signs in many undoubted cases of cervical rib, and the presence of such signs where the ribs are apparently normal. The practical outcome is very satisfactory. A most painful and crippling condition can be completely relieved by a very simple and safe operation.

[1] The Swedenborg Society, 20, Hart Street, London, W.C.1. Two volumes. (30s.)

[2] *Amer. Journ. Surg.*, 1935, xxviii, 669.

TO MELBOURNE

On Friday and Saturday last the two main parties of the "B.M.A. Round-the-World Tour" sailed for Canada and the United States on board the *Duchess of Richmond* and the *Georgic*. The Canadian party is due at Montreal on August 3rd, and the U.S. party at New York on August 4th. Welcomes are to be given them on arrival in port by representative members of the American Medical Association and the Canadian Medical Association. The two parties will meet on August 14th at San Francisco, sailing thence together, some three hundred strong, on the *Aorangi* across the Pacific, and arriving on Monday, September 9th, at Melbourne for the 103rd Annual Meeting, as guests of the Victorian Branch. Two or three passages may be quoted from an anticipatory leading article in the *Medical Journal of Australia*. "The Annual Meeting of the British Medical Association, to be held in Melbourne next September, will be a unique event in the history of Australian medicine. . . . The Victorian Branch is naturally proud of its honour, but its members are most anxious that the other Australian Branches shall take an active share in the meeting and also in its preliminary arrangements. To this end two members from each Branch have been appointed to the Executive Committee. . . . Those of the community who look on the Association as something like a trades union will see a large delegation of medical men and women travelling across the world to meet their overseas colleagues and discuss the cause of disease, its prevention, and its treatment. This will make the effort of its organizers worth while. . . . Of all the medical gatherings that have taken place in the Commonwealth of Australia this will be the most important and the most worth while."

Sir Arthur Robinson, who became Permanent Secretary to the Ministry of Health in 1920 on the death of Sir Robert Morant, has accepted the post of Chairman of the Supply Board, and Sir George Chrystal, who has been Secretary to the Ministry of Pensions since 1919, succeeds him at the Ministry of Health.

MIDDLESEX HOSPITAL SCHOOL CENTENARY CELEBRATION ON JULY 24th

The hundredth anniversary of the foundation of Middlesex Hospital Medical School was celebrated at the newly constructed hospital on July 24th. H.R.H. Prince Arthur of Connaught presided, and around him on the terrace were grouped the staff of the school and distinguished visitors, while a large company were accommodated in the courtyard under an awning. A procession was formed, headed by the Dean (Dr. H. E. A. Boldero), followed by the President of the British College of Obstetrics and Gynaecology (Dr. J. S. Fairbairn), the Deputy Master of the Society of Apothecaries (Dr. Wakelin Barratt), the Regius Professor of Physic, Cambridge (Sir Walter Langdon-Brown), the Dean of the Medical Faculty of Oxford (Dr. K. J. Franklin), deputizing for the Regius Professor of Medicine, the President of the Royal College of Surgeons (Sir Cuthbert Wallace), the President of the Royal College of Physicians (Lord Dawson of Penn), and the Chancellor of the University of London (the Earl of Athlone). Each of the representatives of corporate bodies was preceded by his mace-bearer.

A Retrospect

Mr. A. E. Webb-Johnson, treasurer of the School, gave an address entitled "The First Hundred Years." He referred pithily to the great changes which had taken place in society and in medicine and at Middlesex itself. In the neighbourhood of the hospital it was no longer possible, as it was a hundred years ago, to stroll in Marylebone Fields, or hunt the hare before dinner and the fox after in Marylebone Park, or go snipe-shooting between where the hospital now stands and Tottenham Court Road. Turning to the origin of the School, he said that William Hunter was attached for a time to Middlesex Hospital, and twenty years afterwards built his famous school of anatomy in Great Windmill Street at the top of Haymarket, at a house which now formed the dressing rooms of the Lyric Theatre. Hunter's school of anatomy was taken over by Sir Charles Bell in 1812, and became for all practical purposes a school of Middlesex Hospital. This convenient alliance was disturbed when the University of London was founded, for Bell was persuaded to accept a professorship, as was Sir Thomas Watson, a physician of Middlesex. The University authorities thereupon looked to Middlesex to become the centre of clinical study in the new University, but Middlesex refused the proffered alliance, and the University decided to build its own hospital, now University College Hospital. When that hospital was built the Middlesex staff retired from their professorships at University College, as they did also from King's College on the building of King's College Hospital. The governors agreed on the petition of the medical staff to establish at Middlesex a complete medical school, so that all the subjects of the curriculum could be taught within the precincts. Thus the School, though not exactly a child of the University, was born as a result of the foundation of the University; perhaps it might be called the prodigal son, but it had long since returned home, and was proud to be called a school of the University.

Lord Dawson of Penn brought the felicitations of the Royal College of Physicians, to whose roll of presidents, he said, Middlesex had contributed some eminent names. He mentioned two in particular—Sir Richard Douglas Powell (president, 1905–10) and Sir Thomas Watson (1862–7). He wished also to mention their great emeritus, present with them on that occasion, Sir John Bland-Sutton, who had contributed service greater almost than any man of his generation.

Sir Cuthbert Wallace joined in the congratulations in the name of the Royal College of Surgeons. Measured in terms of human life, a hundred years was a long period, but it brought an institution only to the stage of adolescence. The school had the wisdom which came from experience and the vitality which came from youth. The bonds between the school and the Royal College were close; many of the teachers were sons of the College, its surgeons had served as counsellors, and Sir John Bland-Sutton had been a distinguished president (1923–6).

The Dean's Report

The Dean then gave a report on the past academic year. He mentioned continued co-operation with the London County Council; facilities which the Council was affording were proving of real value. During the past year Dr. Graham Hodgson had been appointed to the honorary staff; he had given much time and original thought to the creation of the new *x*-ray department, and very shortly that department would be an active teaching centre for his specialty. The growth of the new orthopaedic department and the establishment of a new fractures service had led the governors to create a new post, that of assistant orthopaedic surgeon, which was to be filled by Mr. Philip Wiles. In March last the first floor of the crosspiece of the new hospital was opened for the reception of patients in the clinical research unit. This was now a busy and active unit in which more than one specialized investigation was being undertaken. The school would greatly benefit by the recent opening of the clinical lecture theatre, towards which many Middlesex men had contributed. The council had been giving consideration to the scholarships: there were many scholarships at the London schools for men who had done their pre-clinical studies elsewhere, and the council had decided to give equal opportunities for London students and to institute two scholarships of £100 each for London men. That day Mr. Meyerstein had sent him word that he wished to give £3,000 to provide the endowment for one of them. The dean's speech was punctuated by the noise of building, and he mentioned that that was again due to Mr. Meyerstein, who had given £20,000 for additions to the residential accommodation for students—a work now proceeding.

Presentation of Prizes

In presenting prizes and medals to students and nurses the Earl of Athlone paid a tribute to all those who, from the chairman downwards, had turned what, during his own chairmanship of the hospital, was a decrepit relic of the past into the ultra-modern building in which they were now assembled. He had never expected to see the work accomplished in so short a time. Speaking to the successful students, he said that he understood some of them were contemplating the R.A.M.C. or the R.N.M.S. as a career. These services had many attractions to offer. He also added a piece of past history which he did not think was generally known. After what was called the Athlone Committee had sent in its report on post-graduate education in London, he was asked as chairman of Middlesex Hospital by the Ministry of Health whether the hospital would agree to become the post-graduate school under the proposed scheme. He could imagine no more perfect hospital than Middlesex, as it now stood, for that purpose. The opinion was strongly held in the committee, however, and in the medical profession generally, that graduate and post-graduate teaching should not be carried out under the same roof. Mr. Webb-Johnson, who was then dean, did not agree, but he was unable to make his views prevail, and as the governing body had no intention of giving up a school with so great history the invitation was declined. When he looked around him that day and saw the present students and the evident state of efficiency of the school he was convinced that they could not have done otherwise.

Mr. S. A. COURTAULD, chairman of the council of the School, voiced the thanks of the company to the Chancellor. It was mentioned that *The Story of the Middlesex Hospital Medical School* had been written by Dr. Campbell Thomson, a former dean, to commemorate the occasion.

A Scientific Evening

Later a " scientific evening " was held at the hospital. Prince Arthur of Connaught and Mr. Courtauld received a large number of guests in the board room, and afterwards, members of the staff acting as guides, a visit of inspection was paid to the various departments of the medical school and the new portion of the hospital. The new *x*-ray diagnostic department was the feature of special interest. Twelve rooms were open for inspection, the first containing the stereoscopic chest apparatus, electromagnetically controlled, with a tube of the rotating anode type, with which a radiogram of the chest can be taken in 1/300 of a second. In the same room were a motor-driven tilting table, used chiefly for barium work, and a device for taking serial radiograms of the duodenal cap with compression. The transformer used in this room was stated to be the most powerful in the world. In another room the *x*-ray couch had a tube distance of 6½ feet, so as to make use of teleradiography for bone work and avoid distortion. The rest rooms, reporting rooms, drying and dark rooms are all furnished according to the most modern ideas. In the dark room, for example, the films enter by means of an electrical conveyor ; the developing tanks are thermostatically kept at a constant temperature, and electromagnetic clocks time the period of development. Adjoining the dark room is a mixing room, where the developing and fixing solutions are mixed in large tanks and run by pipe lines to the tanks in the dark room. A light-trap revolving hatch passes the films into the drying room, where there is a drying cabinet through which 35,000 cubic feet of filtered air is blown per hour at 90° C. The films are conveyed on an endless chain driven by a motor and come out completely dry in twenty minutes, so that thirty-five minutes after the film has been taken it is developed and dried and has the patient's name stencilled upon it. It is estimated that this department, the equipment of which has cost something under £13,000, will be capable of dealing with 30,000 to 40,000 cases in a year. In the basement an *x*-ray pathological museum has been constructed, divided into ten sections of viewing boxes, each section corresponding to some particular part of the body.

Elsewhere the visitors saw a well-staged radium exhibit, one display illustrating the developments in radium therapy during the last twenty-five years, another the radium technique of to-day, and a third the effects of radiations on living tissues. In another department a new apparatus for carrying out artificial respiration was demonstrated. There were also demonstrations of methods used in examining foods, drugs, stimulants, and soaps ; of the use of biochemical analysis in medicine ; of the chemical processes occurring in minute pieces of tissue ; of the microscopical diagnosis of cancer ; and of the various procedures for dealing with bacteria and viruses, including the ultramicroscope and the ultra-centrifuge. Professor W. B. Tuck conducted some experiments with liquid air, and Professor Samson Wright showed a cinematograph film of the circulation of the blood.

In the Dean's room were a number of interesting portraits: paintings of Cheselden, William Hunter, and Vesalius, which had been brought to Middlesex by Sir Charles Bell from his school of anatomy in Great Windmill Street ; while other paintings were of the six founders of the school—Bell himself, Herbert Mayo, J. Moncrieff Arnott, Thomas Watson, E. W. Tuson, and Francis Hawkins. The private case-book of Bell was on view, as well as, in the common room, a large collection of photographs and engravings of Middlesex men all down the hundred years to the present time.

Visitors saw the beautiful chapel, where some extensive mosaic work is being carried out to commemorate benefactors, members of the medical staff, and others connected with the hospital.

THE COMMEMORATIVE BOOK

Dr. CAMPBELL THOMSON'S *Story of the Middlesex Hospital Medical School*[1] somewhat understates the scope of his history, which tells much about the hospital as well as about the school. Prince Arthur of Connaught, as chairman of the hospital, shows that the author has been too modest and self-effacing in describing all the good work done during the difficult years 1908–19, when Campbell Thomson himself acted as dean of the school.

The story is complete. It tells of the beginnings of a small charity in 1745, with six to ten beds for lying-in women. A year later the number of beds was increased to " fifteen for regular use and three spare ones for accidents." The name of the institution was changed from the Middlesex Infirmary to the Middlesex Hospital, and it was definitely designed for the relief of the " sick and lame." Under a succession of competent leaders the hospital now maintains seven hundred and fifty beds, and is justly looked upon as one of the great medical charities of London. Built upon a clay foundation some dry summers caused serious structural injuries, which led to complete rebuilding and so to a model hospital.

As regards the school there is a record of a few surgical pupils in 1746, but it was not until 1766 that the first physician's clerk appears. From an early period there had been a slight connexion between the Windmill Street School of Medicine and the hospital, for in 1748 Dr. William Hunter, founder of the school, was officiating as man-midwife-in-ordinary during the absence of Dr. Layard, who had been granted long leave of absence from duty. Charles Bell came to London to seek his fortune in 1804, and soon took over the Windmill Street School, became attached to the Middlesex Hospital as lecturer on anatomy, was elected surgeon after a stiff contest in 1814, and returned to Edinburgh as professor of surgery in 1836. The prestige of Bell as a teacher, surgeon, and proprietor of the Hunterian School brought a large number of students to the Middlesex Hospital, and his retirement was followed by many lean years. When the University of London was founded there was some talk of the hospital being affiliated with it for clinical work. Religious feelings were strong and narrow at the time, the governors decided that they could not associate it with an unsectarian body, and University College Hospital came into existence. In 1835 a proprietary medical school was established in the Middlesex Hospital, the teachers being paid *pro rata* from the students' fees, and in 1896 the school became blended with the hospital.

The book is enlivened with reminiscences of various students. They show that life was less strenuous for them than for the present generation, and on the whole less healthy. There were fewer means of working off superabundant energy, for there were no organized games until 1889. As late as 1870 there were draghounds at Golders Green, foxhounds at Edgware, and harriers at Hendon for those who could afford such luxuries. But the majority of students were poor, and only too often visited their " uncles " if they wanted to visit Cremorne, Highbury Barn, " The Pav," or even the gallery or pit of a theatre on Saturday nights. No arrangements were made for feeding them in the hospital ; restaurants were few and expensive. They lived in cheap lodgings off Tottenham Court Road, the public-house and billiards were the chief attractions, and the temptations were so great that, as Sir Alfred Gilbert used to say when he was a medical student before he took to sculpture, there were many streets which, by order of his father, were taboo, even when he went to early lecture at the hospital.

The whole book is well worth reading, and is illustrated with excellent portraits of various members of the staff from 1935 to the present time. It presents, too, some interesting bibliographical peculiarities which will serve to mark this as the first edition. The date on page 1 is altered by writing " 7 " above the " 8 " ; two alterations on page 53 are made by the introduction of a printed slip, and a similar method is followed on page 91, where a new sentence is introduced.

[1] *The Story of the Middlesex Hospital Medical School.* By H. Campbell Thomson, M.D., F.R.C.P. London: John Murray. 1935. (10s. 6d. net.)

DEPUTATION ON MATERNAL MORTALITY

Sir Kingsley Wood, the Minister of Health, received a deputation on July 23rd on the subject of maternal mortality and morbidity from the Standing Joint Committee of Industrial Women's Organizations.

Dr. Esther Rickards, speaking from ten years' experience of maternity work at Tottenham and on the London County Council, said that no local authority was at present using to the full its powers to provide maternity services. As a result the services in most areas were inadequate. She urged that the Ministry should compel local authorities to provide satisfactory services. Dr. Rickards referred also to the standard of work of medical practitioners employed by local authorities, and suggested that the terms of service should be made more attractive in order to secure a higher standard, and that only doctors with special obstetrical experience be employed in the maternity services. She urged, also, that there should be better training for midwives and that a municipal service of midwifery should be provided.

Alderman Rose Davies said that the question of maternal morbidity required consideration as well as that of maternal mortality. She spoke of conditions in Glamorgan and the Rhondda, and gave an account of the satisfactory results following the work of the Birthday Trust in the latter district; she thought it was desirable that work of this kind should be undertaken by local authorities, and she asked for special financial assistance for distressed areas. Mrs. Barton stressed the importance of a proper provision of home-helps. She also urged that a maternity patient should not be moved for at least twenty-four hours after her confinement, and that where a confinement took place in hospital the patient should not be sent home until fifteen days had elapsed.

Miss Sutherland drew the Minister's attention to the report of the sixteenth National Conference of Labour Women, which contained concrete suggestions for improving the maternity service. She stressed the need for a greater provision of post-natal clinics and for an inquiry into maternal morbidity, with particular reference to the question of nutrition; and asked that local authorities should be urged to use more extensively their power to supply milk and meals. She also pressed for legislation to secure the elimination of the untrained handywoman. Mrs. Ayrton Gould said that a difficulty arose in the case of pregnant women who were employed. The result of pregnancy was commonly the loss of employment, and a woman who lost employment in this way was often unable to obtain either unemployment insurance benefit or health insurance benefit. She urged, also, that the Government should ratify the Washington Maternity Convention, which would prevent the employment of women six weeks before and after the date of confinement.

THE MINISTER'S REPLY

In his reply Sir Kingsley Wood said that the failure of the maternal mortality rate to fall was a matter of real national concern, but we could not afford to be defeatists. The problem was a complex one, not capable of any single solution. It required constant attention, research, and patience. Sight must not be lost of the fact that much was already being done. Thus, comparing 1931 with 1934, there had been a steady increase in the provision of maternity services made, directly and indirectly, by local authorities in England and Wales, the number of ante-natal clinics having increased by nearly 20 per cent., the number of women attending them by 23 per cent.—the number of attendances at ante-natal clinics reached nearly one million last year—the number of maternity beds by over 10 per cent., and the number of women admitted to them by 30 per cent. In addition, the quality of maternity accommodation controlled by local authorities had been improved by concentration at the most suitable institutions, and most municipal hospitals aimed at retaining a patient for fourteen days after delivery. The majority of maternity and child welfare authorities now provided obstetric consultants, some 400 local authorities provided food or milk free or at cost price, and 133 provided home-helps. Action to stimulate the authorities of the areas where development was needed would be continued. Indeed, the Ministry of Health had been constantly pressing upon local authorities the real and urgent need of improving and effecting services wherever necessary, and there never had been any question of the curtailment of these services on financial grounds, even at the height of the financial crisis, a fact which had been made clear in the various circulars issued by the Ministry of Health. On the contrary, special reference had been made, not only to the need of maintaining the maternity and child welfare services unimpaired, but also to the need of their development, a point which was again emphasized last year, when it was decided to institute special investigations into areas with persistently high rates of maternal mortality. Besides taking steps to secure the provision of adequate and efficient maternity and child welfare services, general research work was being consistently encouraged. Through the willing and voluntary co-operation of doctors and midwives with the officers of the Ministry of Health—a co-operation which might be impaired if there were any attempt to impose compulsion—the greater number of maternal deaths were reported to, and investigated by, the medical officers of health. Indeed, in this way information about fully three-quarters of the maternal deaths each year was obtained and forwarded to the Ministry of Health.

In connexion with the recommendations of the Departmental Committee on Maternal Mortality and Morbidity as to post-natal care, Sir Kingsley mentioned that post-natal clinics were increasing in number, and that some local authorities had already made arrangements for the post-natal medical examination of patients. When the results of the present intensive investigation into maternal mortality had been received it would be possible to decide the next steps to be taken in connexion with maternal morbidity. More research and expert investigation into the whole problem was needed, and while there was no foundation at present for any definite statements on the relation of nutrition to maternal mortality or morbidity, special attention was being paid to this aspect of the problem in the current investigation of England and Wales.

Sir Kingsley Wood, in conclusion, said that every possible step would continue to be taken to secure that the maternity services in all areas were adequate and effective, and that he believed that more could be accomplished as a rule by persuasion rather than by compulsion. There was still a great deal to be done to persuade women to use the services provided for them, especially in ante-natal services, and he attached great importance to the special studies now being made in all areas with persistently high maternal mortality rates. Proposals for an organized service of salaried midwives were receiving his careful attention, and he was now awaiting the views of the local authorities, which he desired to have before arriving at a conclusion.

TOXICITY OF INDUSTRIAL SOLVENTS

At the request of the Home Office, the Medical Research Council has undertaken to promote investigation into the question whether various volatile substances might injure the health of workers using them under industrial conditions. To assist and advise it in this matter, the Council has appointed the following special committee:

Sir Joseph Barcroft, F.R.S. (chairman).
J. C. Bridge, F.R.C.S.Ed.
Professor A. J. Clark, M.D., F.R.C.P., F.R.S.
A. G. Green, M.Sc., F.R.S.
Professor J. A. Gunn, M.D., D.Sc., F.R.C.P.
Professor E. H. Kettle, M.D., F.R.C.P.
H. B. Morgan, M.D.
J. Davidson Pratt, B.Sc.
D. R. Wilson.
Sir David Munro, F.R.C.S.Ed. (secretary).

The William Gibson Research Scholarship for Medical Women, offered by the Royal Society of Medicine and tenable for two years, has been awarded to Dr. F. Stephen-Lewis of the University of the Witwatersrand, Johannesburg. The holder intends to carry out a further research in the chemistry of South African plants, particularly those used by the natives as medicines.

INTERNATIONAL NEUROLOGICAL CONGRESS IN LONDON

The second International Neurological Congress assembled in London, at University College, from July 29th to August 2nd, under the presidency of Dr. GORDON HOLMES. Sir Charles Sherrington was the first choice of president, but he was compelled to withhold assent on grounds of health. Dr. S. A. Kinnier Wilson acted as secretary-general, with Dr. Macdonald Critchley and Dr. E. A. Carmichael as assistant secretaries, and Dr. Anthony Feiling as treasurer. The congress was attended by representatives of twenty countries, and nearly three hundred papers were presented. On one afternoon the congress met in seven sections and considered eighty papers. Four special discussions were held, the subjects being: the epilepsies, their aetiology, pathogenesis, and treatment; the physiology and pathology of the cerebro-spinal fluid; the functions of the frontal lobe; and the hypothalamus and the central representation of the autonomic system. Except on the opening day, when the discussion on the epilepsies occupied both morning and afternoon, the mornings were devoted to these special discussions and the afternoons to miscellaneous communications. The official languages of the congress were English, French, German, Italian, and Spanish, but abstracts of papers had to be in one of the three first languages.

Aetiology of Epilepsy

During the discussion on the epilepsies Professor OTTO MARBURG of Vienna occupied the chair at the first session and Professor OTTORINO ROSSI of Pavia at the second. The majority of the papers were in German, and the open discussions were almost wholly taken up by German speakers. It was a Frenchman and an Italian, however, who introduced the subject of aetiology. Professor JEAN ABADIE of Bordeaux dealt with the general aetiology of common epilepsy, which, he said, was not a true disease, but an anatomo-clinical syndrome. It was not a neurosis, but a lesional manifestation of the nerve centres. The old idea of an epilepsy called idiopathic, as opposed to symptomatic epilepsy, had been completely given up. Common epilepsy was a syndrome resulting from brain lesions, variable in nature and origin, but incontestably existing. The most frequent causes of the lesions were obstetrical trauma and head injuries or toxic infections during infancy. Obstetrical trauma should be given the first place in the scale of frequency. Among the infections of infancy it was important to bear in mind hereditary syphilis, also alcoholism in the parents. From these considerations it followed that there was a close correspondence between epilepsy and infantile convulsions.

The special aetiology of epilepsy was discussed by Professor V. M. BUSCAINO of Catania. He divided the causative factors of convulsive attacks of the epileptic type into four principal groups: predisposing, precursory, facilitative, and exciting (*déchaînantes*). The first included hereditary influences; the second, cerebral lesions; facilitative factors included variations of pressure and atmospheric electricity, menstruation or pregnancy, spasm of the subcortical vessels, the state of vagotonia, alkalosis, strong emotion, and so forth; and the exciting factors were those which provoked epileptic attack by a chemico-physical mechanism, such as the presence in the circulation of placental products (eclampsia) or renal products (uraemia). Thus the most diverse groups were to be observed in epilepsy. In the same epileptic the attacks might have different origins. It was sufficient to bring about an attack if one or other of the facilitative factors was strongly in evidence; in such conditions the minimum exciting factor induced the attack.

Pathogenesis

Dr. W. G. LENNOX of Boston discussed the physiological pathogenesis of epilepsy, pointing out that in patients having frequent seizures certain alterations of physiological processes in the brain modified the frequency of the seizures. The problem of acid-base equilibrium and of oxygen and blood supply had been specially studied in his laboratories. Alkalosis induced by over-ventilation or by ingestion of alkali tended to increase seizures; acidosis induced by fasting, a ketogenic diet, by ingestion of acids or acid-forming salts, by breathing carbon dioxide, or by muscular activity tended to decrease seizures. The total blood flow through the brain, as measured by a thermo-electric recorder inserted in the internal jugular vein, did not show reduction immediately before the seizure except when the seizure was induced by over-ventilation. Generalized cerebral anaemia was shown not to be the cause of spontaneous seizures. With regard to oxygen, the volume of oxygen consumed by patients in periods between seizures was normal or moderately reduced. Immediately before and during non-convulsive seizures there was no significant alteration in the total oxygen consumption. The oxygen saturation of arterial blood, measured in ninety patients, was abnormally low (between 94 and 86 per cent. saturation) in one-half of them. Blood from an arm vein, examined in one hundred instances, had an average oxygen saturation of 65 per cent., which was 7 per cent. lower than the average saturation of healthy persons, indicating a stagnant flow of blood through the extremities. Blood leaving the brain by the internal jugular vein, examined in 130 instances, had an average oxygen saturation of 63 per cent., a normal figure. Blood drawn during a mild seizure or *in status* was also found to be normally saturated.

An acute cerebral anoxaemia was produced in two ways: by breathing pure nitrogen and by inducing orthostatic syncope consequent on ingestion of sodium nitrite. Out of twenty grand mal cases rendered unconscious by one of these procedures, only one experienced his usual type of grand mal seizure; on the other hand, in thirteen patients having frequent petit mal, with or without mild localized convulsive movements, the patient's usual seizure was readily and consistently brought about by an induction of anoxaemia or cerebral anaemia. Usually the degree of anoxaemia was insufficient to produce unconsciousness in the normal individual. The electrical activity of the brain was also investigated. Petit mal seizures were invariably preceded or accompanied by a burst of electrical potentials about ten times the voltage and one-fifth the frequency of the patient's usual potentials. When clonic movements were present they were synchronous with these large waves; similar voluntary movements were unattended by differences in electrical potentials. The form of the large waves was individual for each patient. Furthermore, the electro-encephalograms of patients, taken while they were symptom-free, showed small disturbances of rhythm suggestive of sub-threshold seizures. The display of these electro-encephalograms was a very interesting feature of the discussion, and Dr. Lennox concluded his remarks with the following observation:

"For what takes place in the brain when a seizure occurs we no longer have to depend on the evidence of sensation or muscle movement, as, through a door unexpectedly opened, we can discern what is happening within the brain. We can speak plainly of its electrical activity. We have obtained graphs of electrical potentials of patients during hundreds of seizures. The fundamental clinical feature of the epileptic seizure is disturbance of consciousness. The large waves represent a synchronization of many disparate activities. They mean that the customary harmony of the symphony orchestra has become a single note, that constitutional government has given place to the totalitarian state. Probably our hope of knowing the pathogenesis of epilepsy rests on finding the physico-chemical process involved in the electrical activity of the neurons. We who are here can hardly hope to arrive at a solution of this problem, which is linked up with heredity, in our lifetime, but we have our rewards, and it is better to travel hopefully than to arrive."

Physico-chemical Factors

The physico-chemical factors in convulsive reactivity, with special reference to measurements of the permeability of the cell membranes, was further discussed in a paper by Professor E. A. SPIEGEL and Professor M. SPIEGEL-ADOLF of Philadelphia. The fundamental mechanism in

the pathogenesis of convulsions, they said, must be sought in alterations of the excitable nervous elements themselves. Excitation was due, according to Ostwald and others, to changes of ion concentration on semi-permeable cell surfaces, and therefore it might be expected that at least some agents which excited the central nervous system or influenced its excitability acted by changing the permeability of the cell membranes and thus the ion concentration. They discussed experiments in which a marked parallelism in the effect upon the convulsive reactivity and upon the permeability of the brain tissue had been observed. The experiments seemed to justify the conclusion that the common fundamental process underlying the influence of various agents upon the convulsive reactivity was a change of the permeability on the surface of the excitable elements in the central nervous system.

Dr. FELIX FRISCH of Vienna also discussed the chemical pathogenesis of epilepsy. He considered the physico-chemical process concerned to be the expression of a peculiar type of cell constitution. Similar phenomena occurred among non-epileptics, especially persons with a tendency to migraine. The vegetative nervous system in its relation to epilepsy was dealt with in a short paper by Professor K. ORZECHOWSKI of Warsaw, and the pathological anatomy of epilepsy by Professor M. MINKOWSKI of Zurich. In the course of a short open discussion Dr. PRADOS Y SICH of Madrid mentioned experiments carried out in the Cajal Institute which had been made with a view to discovering whether the haemato-encephalic barrier played a part in the mechanism of experimental convulsive seizure. A standard camphor solution was used on cats which were injected intravenously with dyes, and the results were uniformly that the whole central nervous system of the cat affected with epileptic fits appeared intensely stained with the dye. The conclusion was that during an experimental convulsive seizure the haemato-encephalic barrier broke down. Dr. S. OBRADOR, also of Madrid, dealt with the problem of sugar metabolism in relation to susceptibility to epileptic fits. It was found that the different factors affecting the blood sugar level—for instance, adrenaline, insulin injection, pancreatic extract, and so on—had no influence on the susceptibility of the animal to the injection of convulsive drugs. During the fit there was a parallel increase of the sugar in the blood and cerebro-spinal fluid, due to an adrenal mechanism. This was further proved by the fact that in animals deprived of adrenaline there did not appear to be an increase of such sugar. Dr. P. PAGNIEZ of Paris and Dr. TERLBJERG of Copenhagen also joined in the discussion, the latter dealing with the connexion between epilepsy and water metabolism, which, he said, needed further explanation.

Treatment of Epilepsy

The subject of treatment was opened by Dr. A. ULRICH of Zurich, who gave a survey of the medical management of the epileptic state. His paper was a review of the methods of treatment in vogue in the institutes for epileptics on the Continent, in England, and in America, the principal resort being to bromide, barbituric acid, and borax preparations. Hormone treatment was little known, as also was treatment by snake venom. Dr. Ulrich discussed the tendencies in treatment, particularly in Switzerland and in Germany, and the manner in which dosage was adjusted.

Dr. M. SGALITZER of Vienna spoke of epilepsy treated by *x* rays. He had treated sixty-six cases, leaving out of account cases treated during the last two years. Of eighteen cases of traumatic epilepsy five were not influenced at all by *x*-ray treatment, nine were improved, and four decidedly improved, so that no attack had taken place for two or three years. Of thirty cases of genuine epilepsy eight were uninfluenced, sixteen improved, and six decidedly improved. Of eight cases based on hydrocephalus six had had no attacks for two years. In a number of cases of petit mal improvement was observed, but not total disappearance of fits. All the cases had been treated unavailingly with luminal before being given *x*-ray treatment. Treatment was adjusted to the nature of the case and its sensitiveness to the rays. He treated through a heavy filter on several successive days. The largest dose was given in the hydrocephalic cases. He believed that it was absolutely justified to apply *x*-ray treatment to all epilepsies refractory to medical remedies. In the ensuing discussion it was suggested by Dr. E. MEDEA of Milan that Dr. Sgalitzer had shown too much optimism, and Dr. L. BENEDEK of Debreczen thought they should be very cautious in claiming results from radiotherapy.

Dr. L. J. J. MUSKENS of Amsterdam discussed institutional and general treatment, saying that epilepsy had always been the Cinderella among diseases. The refusal of the general hospitals to admit either epileptics or insane patients meant that in the professional mind both conditions were grouped together, and no exception was made for the early stages of epilepsy. It was now being recognized, however, that in the early stages much might be done by careful ordering of the patient's life and judicious medications. Long experience with patients, both in private practice and in institutions, showed that in some cases the disease appeared to have come to a standstill, even when no careful line of treatment had been adopted. Treatment of the early stages of epilepsy was of great importance, and there were cases the handling of which was essentially the work of a specialist in the malady. For the ordinary medical student a clinic for these cases was too slow to have much teaching value, nor was it sufficiently interesting. In his opinion the only way to deal with epilepsy was to have an institution for it practically alone, and to admit there all patients not definitely chronic or seriously mental. Such a hospital need not be expensive to maintain, but not too much help must be expected from patients' fees. On the basis of his experience of twenty-five years with epileptic patients, both in institutions and in private, he recommended the establishment of a central institution, preferably in a medical centre, where a staff of competent specialists was at hand, and early cases—all cases not showing serious mental symptoms—would be admitted. Such an institution would be a true national economy in the long run ; it would attract attention to the treatment of a woefully neglected malady and afford a training school for nurses and doctors.

Surgical Treatment of Epilepsy

Professor WILDER PENFIELD of Montreal said that of the proposed surgical treatments in essential epilepsy cervico-thoracic sympathetic ganglionectomy had failed, except in the occasional case associated with obvious sympathetic abnormality ; carotid body removal and carotid sinus denervation were at present without theoretical justification, except in the rare case of demonstrably abnormal carotid sinus reflex ; subtemporal decompression should be carried out only occasionally as an incident to craniotomies undertaken for other purposes, or in rare instances of chronic subdural fluid collection ; and spinal insufflation of air in his clinic had been effective as a therapeutic measure only in patients under 16 years of age whose seizures had occurred for four years or less. Epileptiform seizures, secondary to lesions of the brain, when they first made their appearance in adult life, were caused in the great majority of cases by tumour or cicatrix, and an encephalogram should be done almost as a routine procedure. In his experience the operative excision of such cicatrices and of areas of focal atrophy gave an even better result from the point of view of cessation of attacks than did radical extirpation of the more benign types of brain tumour. He gave the following results for seventy-five major craniotomies extending over six years (there had been two operative deaths).

	No. of Cases	Per Cent. Cured	Per Cent. Improved.	Per Cent. Failure
Excision of meningo-cerebral cicatrix	22	46	32	23
Excision of focal cerebral cicatrix or focal atrophy	22	41	32	27
Exploration without excision	24	8	12.5	79
Ligation of cerebral arteries	4	25	0	75
Evacuation of subdural fluid	3	33	33	33

A case of epilepsy could never be certified as cured : former sufferers must always be considered potential epileptics, and the " cures " he had listed must not be considered final, but they were none the less gratifying to the patient. Dr. DE THURZÓ of Debreczen spoke of good results obtained with spinal insufflation of air.

Dr. H. URBAN of Vienna demonstrated the use of contrast media in the handling of epilepsy, and Dr. ARTHUR SCHÜLLER of the same city showed some notable *x*-ray pictures of gross anomalies of the skull, also of the results of skull and brain injury, tumours in the brain, shrivelling processes in the skull cavity, and maldevelopment of the brain, microcephaly, etc. Another Austrian visitor, Professor G. STIEFLER, discussed the failure of the primary joint reflexes in epileptic attacks, and Professor G. MARINESCO of Bucarest the role of the carotid sinus in epilepsy. Professor OTTO MARBURG, who had occupied the chair, closed the discussion. Even this did not exhaust the interest in epilepsy, for two later sectional discussions, at each of which a dozen papers were presented, had been arranged.

Address by Professor Pavlov

On Tuesday morning the congress in plenary session discussed the physiology and pathology of the cerebro-spinal fluid, under the chairmanship of Dr. O. FOERSTER of Breslau, when papers were presented by Mr. HUGH CAIRNS of London and Dr. L. H. WEED of Baltimore, and three German-speaking authors. In the afternoon great interest was taken in an address by Professor PAVLOV of Leningrad, who made some observations in the session of clinical neurology on the types of higher nerve function and their connexion with the neuroses and psychoses and the physiological mechanisms of neurotic and psychotic symptoms. Professor Pavlov, who spoke in rather halting German, received a great ovation on rising, the members standing and applauding, and again on resuming his seat ; the continuation of the discussion was suspended while he autographed innumerable programmes! In the section of anatomy another honorary member of the congress, Sir Charles Sherrington, participated in the discussion. A report of Tuesday's and the later proceedings, including Professor Pavlov's address, will be published in our next issue.

Reports of Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

The summer meeting of the Association of Clinical Pathologists was held in the pathological department of the Princess Alice Memorial Hospital, Eastbourne, on July 20th, with Dr. A. G. SHERA, pathologist to the hospital, in the chair.

Diphtheria: Prophylaxis and Diagnosis

Dr. R. C. O'BRIEN spoke on certain problems in connexion with diphtheria prophylactics. It was admitted, he said, that by the use of prophylactics it was possible greatly to reduce the incidence of diphtheria in a community ; as illustration he showed charts of the incidence of diphtheria in the Birmingham fever hospitals before and after the introduction of prophylactic immunization. As a result of this the incidence had fallen from 10 per cent. to almost *nil*. The prophylactics were available ; the problem now was to determine the most suitable prophylactic, and to ensure its intelligent use. He pointed out that there was no absolute line of demarcation between Schick-positive and Schick-negative individuals. Subjects whose blood showed 1/30 of a unit of antitoxin would give a negative Schick reaction ; those possessing less than 1/1000 of a unit would give a positive reaction. The response to any given prophylactic depended to a large extent upon the existence of some " potential antibody " ; this might be described as " basal immunity," and those subjects showing some degree of basal immunity gave the best response to prophylactic immunization. The response to any given prophylactic varied enormously in relation to this basal immunity ; it was on the whole more difficult to produce a satisfactory response in children from sheltered homes than in those who had mixed widely with other children of all ages. On this account it was difficult to dogmatize as to the most effective method of diphtheria prophylaxis and result. Much still remained to be learnt as to the chemical constitution of alum toxoid. Different samples gave a nitrogen content of from 0.2 to 3 mg. per c.cm. The American requirement was that alum toxoid, when injected into a guinea-pig in a dose of 1 c.cm., should produce two units of antitoxin in six weeks. Dr. O'Brien had tested a number of alum toxoids, both American and English. Few of these had reached the American requirement, but he showed that one sample made in London had, in certain guinea-pigs, produced five units. Mr. Glenny found that guinea-pigs gave a better response to two doses of 0.1 c.cm. at an interval of some days than to one of 1 c.cm. Dr. O'Brien dealt briefly with some of the questions put to him by practitioners concerned with diphtheria immunization. The Schick-negative child cannot be regarded as absolutely safe against diphtheritic infection ; a heavy dosage of a virulent organism may overcome the immunity, but the infection would almost invariably be clinically mild. The Moloney-negative reactor is virtually, though not absolutely, safe against unpleasant manifestations after immunization ; immunization does not for practical purposes " sensitize " the subject.

In the course of the discussion that followed Dr. O'Brien pointed out that no matter what form of prophylactic had been used the treated subject could not be regarded as immune unless the immunity was demonstrated by a Schick test. Professor MCLEOD (Leeds) stated that in Leeds nineteen cases of mild diphtheria had developed among over 30,000 children treated with diphtheria prophylactic. Nine of those children were known to be Schick-negative ; the remaining ten had not been tested.

Professor J. W. MCLEOD (Leeds) spoke of the difficulties in the bacteriological diagnosis of diphtheria and a contribution made by new methods to their solution. He showed cultures of the gravis, intermediate, and mitis strains of *C. diphtheriae* growing on tellurite medium, and demonstrated the differences in these strains, both cultural and morphological. He described the medium which he used for the isolation of *C. diphtheriae* and the identification of the strains, and stated that of positive throat swabs examined 11 per cent. gave *C. diphtheriae* on the tellurite medium only, and 3 per cent. on the ordinary Loeffler's medium only. There was a very marked difference in virulence between the three strains. Of the gravis strains all were pathogenic to the guinea-pig, of the intermediate strains about 94 per cent., and of the mitis strains 86 per cent.

Bacteriology of Whooping-cough

Dr. A. D. GARDNER (Oxford) spoke on the bacteriological aspect of whooping-cough. He began by pointing out that although in domestic circles whooping-cough was still taken comparatively lightly, its mortality equals that of scarlet fever and diphtheria combined. He laid stress on the importance of early diagnosis ; for the prevention of epidemic spread it was essential that diagnosis be made in the catarrhal stage before the whoop developed. In this stage bacteriological diagnosis alone was possible. After the second week the characteristic lymphocytosis developed, and the complement-fixation test became positive, but by this time it was too late to prevent spread. Dr. Gardner described his method of isolation of the Bordet-Gengou organism by getting the patient to cough upon specially prepared serum plates. The proportion of positive cultures obtained in the first week was very high ; after this it fell away. A positive culture was rare in the fourth week, and it was doubtful if the subject remained infective to this stage. He was of the opinion that infection was always from case to case, and that carriers do not occur. Dr. Gardner was sceptical as to the therapeutic value of pertussis vaccine. In prophylaxis

there was evidence that vaccine was of the greatest value, but it was essential that the organism used in the preparation of the vaccine be freshly isolated and of a smooth strain ; old, rough cultures were of little use. Failure to produce satisfactory immunity in the past had been due to the use of old, rough strains. Dosage must be large. Dr. Gardner showed graphs illustrating the good results obtained by workers, particularly in the Scandinavian countries, by the use of large doses of a suitable vaccine in the prevention of epidemics. He paid a warm tribute to the assistance he had received from Dr. R. O'Brien of the Wellcome Research Institute in carrying out various investigations. In the ensuing discussion it was pointed out that pathologists working in small laboratories find it impossible to keep on hand a stock of the special medium necessary for the isolation of the *B. pertussis*. Dr. Gardner stated that in Denmark plates of suitable medium in metal Petri dishes are made available by the State laboratory, and expressed the wish that something similar could be done in this country.

Glandular Fever

Dr. L. E. H. Whitby (London) spoke on glandular fever. Dealing with its infectivity he reported one patient who had infected two attendants ; in both cases the incubation period was one week The speaker escaped infection, but there was evidence that he had already suffered from the disorder, though in his case it had been diagnosed as scarlet fever. After the incubation period there was a period of fever lasting for about a week, which might give rise to suspicion of enteric infection ; glandular enlargement appeared in the second week of the disease, and might be accompanied by considerable enlargement of the liver and spleen. The swelling affected the glands very irregularly ; in some cases only the mediastinal or abdominal glands might be involved ; in such cases there might be abdominal pain, and surgery might be invoked. The characteristic blood changes appeared in the pyrexial stage ; the typical blood picture showed white cells of from 20,000 to 40,000, with 70 to 80 per cent. of the mononuclear order ; these cells might be obvious small lymphocytes or might resemble monocytes. Dr. Whitby demonstrated the Paul-Bunnell reaction, which depends upon the fact that sufferers from this disorder develop within their serum heterophil antibodies against sheep red cells. The reaction becomes positive with the appearance of the glandular enlargement ; how long it remains positive is not yet known. A titre of 1 in 100 may be regarded as diagnostic.

Dr. Weston Hurst dealt on broad lines with the clinical pathology of the virus diseases. He pointed out that the virus localized itself within the cell, and that therefore tissue reaction such as was met with in the case of diseases due to organisms which invade the tissues was not found. He showed microscopical preparations and lantern slides illustrating the invasion of the individual cells by virus of various types ; such focal lesions as occurred were necrotic, and marked by an absence of the cells usually associated with infective processes.

PREVENTION OF BLINDNESS IN INDIA

At the fourth conference of the All-India Ophthalmological Society, held in Madras at the end of April, the urgent need for more co-ordinated and energetic measures in the prevention of blindness in India was emphasized, and seven resolutions were adopted for submission to the authorities concerned.

The first of these asked that evidence of practical knowledge of the prophylaxis of ophthalmia neonatorum should be required from all medical practitioners, midwives, or others concerned with the conduct of childbirth. The second resolution asked that in view of the menace to sight arising from the condition sometimes called xerosis of the conjunctiva or keratomalacia, but actually the expression of a multiple food deficiency complex, the special medical officers employed on nutritional research should draw up practical suggestions as to how the food defects may be remedied. The third resolution had reference to the alleged frequency of trachoma in certain regiments of the Indian Army, and asked the authorities under the Government of India responsible for figures published by the International Association for the Prevention of Blindness to explain how these figures were arrived at, and what criteria were employed in making the diagnosis of trachoma. "Should the figures be correct, then these regiments constitute a grave danger, not only to the Indian Army in time of war, but—more important to this society—a grave danger to the civil population of those districts to which such regiments may be transferred in time of peace. It is suggested that the authority concerned—in this case the Government of India—takes the necessary steps to institute an inquiry under competent specialist control to check the figures quoted, and to lay down rules of guidance regarding the diagnosis of trachoma."

Further resolutions asked for early legislation regarding the inspection of the eyes of school children by all the authorities concerned throughout British India and the Indian States ; for a tightening-up in the administration of the machinery dealing with the prevention of small-pox; and for the instruction of the uneducated, especially the rural population, with regard to the prevention of blindness, by such means as broadcasting by radio in the vernacular, distribution of pamphlets and posters through the medical and educational departments, and the employment of a travelling motor unit organized for propaganda work fitted with cinema, posters, and pamphlets, and a dispensary for urgent ophthalmic aid. The final resolution has reference to congenital and acquired syphilis as a potent cause of blindness, and called upon every authority throughout India to institute and foster or extend a branch of its medical department devoted to treatment of the venereal diseases, such special branches to be modelled upon similar departments in Great Britain.

France

Medical Practice in France

The new law dealing with medical and dental practice in France was passed on July 26th, and is therefore now in force. It enacts that practice is to be confined to French subjects, with a few exceptions, and lays down periods of probation before naturalized subjects may practise their profession or hold public appointments. Details were given in our issue of July 20th (p. 117).

Death of the French Centenarian, Dr. Gueniot

We referred some three years ago (*Journal*, 1932, ii, 936) to the celebration of Dr. Guéniot's one-hundredth birthday by the French Academy of Medicine. On that occasion the guest of honour seemed remarkably young and supple in comparison with his elderly juniors who had met him in the main hall of the Academy to congratulate him. The youthful centenarian carried his years with effortless ease ; his gait was elastic, and his voice was clear and ringing when he returned thanks to his many well-wishers, some of whom had just spoken in terms of playful but respectful endearment about the birthday child. These birthday greetings contained more than one reference to a book Dr. Guéniot had written several years ago on how to live to a hundred. Born on November 8th, 1832, he made his way to Paris at an early age, and it was here that he spent his long, full, and varied life. As an obstetrician in charge of a large maternity hospital he welcomed many generations of Parisian newcomers. The title of professor was conferred on him as early as 1869. In 1895 he was elected president of the French Obstetrical Society, and in 1906 president of the French Academy of Medicine. His most important contributions to science and the greater part of his publications were concerned with obstetrics, but his interests ranged over a wide field, and all he wrote was characterized by lucidity and common sense. It was, in fact, as the apostle of common sense and moderation in all things that he impressed his opinions on younger generations. His death on July 16th will, of course, cause no gap in the ranks of active workers, but it has created a sense of loss—the loss of a living monument.

International Union Against Tuberculosis

The executive committee and the council of this society, whose secretary-general is Professor Fernand Bezançon, met in Paris, at the headquarters of the Union, on July 10th and 11th, under the chairmanship of Dr. Piestrzynski, Under Secretary of State for Poland: delegates from twenty countries attended. The administrative meeting of the council was devoted to the preparation of the programme of the Conference of Lisbon, which is due to take place on September 8th, 9th, and 10th, 1936. The agenda of this conference is now definitely settled, and will include the three following subjects: "Radiological Aspects of the Pulmonary Hilum and their Interpretation"—opening report by Professor Lopo de Carvalho (Portugal); "Primary Tuberculous Infection in the Adolescent and the Adult"—opening report by Dr. Olaf Scheel (Norway); and "The Open Case of Tuberculosis in Relation to Family and Domestic Associates"—opening report by Sir Henry Gauvain (Great Britain). At the scientific meeting of the council Professor Lyle Cummins (Cardiff) occupied the chair. Professor Madsen of Copenhagen submitted a report on "Tuberculin Standardization and Tuberculin Tests," and Dr. Kendall Emerson, managing director of the National Tuberculosis Association, gave an account of the work of Dr. Long and his collaborators, who claim to have isolated the active principle of tuberculin. In a discussion, in which Professor Madsen, Professor Lyle Cummins, M. Boquet, Professor F. Bezançon, Professor Sergent, Professor Debré, Dr. Lesné, Dr. Rist, Dr. Troisier, Dr. Saenz, and others took part, the respective merits of Pirquet's cuti-reaction and the Mantoux intradermal test were compared. The majority of the French speakers expressed a preference for the former method, while their colleagues from other countries spoke on behalf of the Mantoux test. They all agreed on the advisability of adopting a standard tuberculin and a uniform tuberculin test.

Scotland

Research Work in Aberdeen City and County

Since May, 1934, the bacteriological work of both the City and the County of Aberdeen has been brought under the unified control of the regional bacteriologist. The annual report for 1934 of the medical officer of health opens with accounts of four investigations which have been undertaken. The first of these relates to an outbreak of Weil's disease in June, 1934, of which a full account appeared in the *British Medical Journal* of December 22nd. In fifteen of the nineteen patients the clinical diagnosis was confirmed by bacteriological or serological tests, and thirteen of the patients were employed in the handling or cleaning of fish. The findings made it clear for the first time that such workers must be included in the occupational groups especially liable to Weil's disease. Persons employed in the trade have the skin on their hands frequently broken by their knives, and presumably infection occurs through the exposed flesh surfaces. The regional bacteriologist, Dr. John Smith, was also concerned in an inquiry into the incidence of the bovine type of tubercle bacilli in pulmonary tuberculosis. Sputum examinations of cases of pulmonary tuberculosis from the county area revealed bovine bacilli in 14 per cent., as compared with the more usual figure of 1 per cent. elsewhere. In sixty-five cases so far examined from the city area six were of bovine infection. No adequate explanation has yet been put forward; the incidence of tubercle bacilli in milk does not appear to be greater in Aberdeen than elsewhere, and there is no evidence that the amount of raw milk consumed is higher than in other parts of the country. Many of the patients gave a history of previous adenitis in youth; the clinical histories did not suggest the possibility of human transmission, but rather of direct infection by milk. Dr. Douglas Bell, senior resident medical officer at the Aberdeen City Hospital, has been conducting an investigation into the value of "one shot" immunization against diphtheria by alum-precipitated toxoid. A series of 257 Schick-positive persons were thus immunized, and 130 were again tested about three months later. Of the thirty-nine adults, 87 per cent. were found to be negative, and 13 per cent. still positive. Of ninety-one children under the age of 14, 94.5 per cent. were found to be positive and 5.5 per cent. negative. An investigation at Woodend Hospital into radiological examination as a possible cause of gene mutation indicated that one abdominal radiological examination must frequently act as a cause of chromosome changes in a person as extensive as those due to exposure to natural radiation throughout a whole lifetime; in the worst case studied (12.5 *r*) the change was four times as extensive. Scattered radiation to the pelvis during examination of other parts of the body is negligible in amount. At Aberdeen also during 1934 the veterinary services of the city and the county have been co-ordinated, and the work of both areas is now performed by a chief veterinary officer with two assistants. This example of co-operation was singled out for favourable comment in the Annual Report for 1934 of the Department of Health for Scotland.

Animal Diseases Research Association

At the annual meeting of the Animal Diseases Research Association, held at its Moredun Institute, Edinburgh, on July 24th, it was stated that since the foundation of the association in 1922 the staff had undertaken the investigation of many diseases of animals, and had done much to elucidate the nature of lamb dysentery, braxy, milk fever, pine, etc. The causal organism of tick-borne fever had also been demonstrated. Scottish agriculturists were pressing for the immediate investigation of other problems, but for this additional workers and equipment, with extension of the present laboratory buildings, would be required. It was estimated that a capital expenditure of £12,000, and further annual maintenance amounting to about £3,000, would be required, and the association resolved to appeal to the Department of Agriculture for grants-in-aid. Professor T. J. Mackie of Edinburgh University said that splendid fundamental and applied research work had been carried out year by year by the staff of this institution. It belonged essentially to the agricultural community, and had developed independently of other institutions, although a great part of the success on the scientific side had been due to the able workers drawn from the veterinary profession and the universities. A scheme for co-operation in future research with the Royal (Dick) Veterinary College, Edinburgh, had been evolved.

Edinburgh Dental School

At the prize-giving of the Edinburgh Dental Hospital and School the dean, Mr. A. C. W. Hutchinson, reported that there were at present 209 students in the school, as against 158 a year ago; of these fifty-six were taking a medical in addition to a dental qualification. Various improvements had been made in the school equipment, the conservation room having been completely refurnished. A committee was at present investigating the relation between the Royal Infirmary and the Dental Hospital, and it was believed that when arrangements had been made to teach the dental students separately from medical students, the students of this school would be provided with a dental education which would not be surpassed by that of any other hospital and school in the country. In the general subjects taken in the School of Medicine, dental students had earned their full quota of medals and certificates, and out of fourteen medals obtained, nine had been gained in competition with medical students. Mr. J. M. Vallance said that, speaking as an official of the Department of Health for Scotland, he realized more and more how much the care of the teeth was an essential part of the scheme of health services throughout the country. Local authorities had already done a fair amount with regard to the dental inspection of school children, but still more required to be done. The approved societies had also recognized the importance of dentistry by allocating a substantial part of their surplus funds for dental benefit.

England and Wales

The Medical Charitable Society for the West Riding of the County of York

The annual meeting of this well-known Yorkshire charity was held at Huddersfield under the chairmanship of Dr. D. L. Cairns, when the report was read by the treasurer, Dr. T. Wardrop Griffith. The society continues to increase its work of utility and beneficence. Essentially a charity—for none of its members, nor any of those who are dependent on them, can claim its help as a right—its membership increases year by year. In 1921 there were 862 members; the year 1935–6 begins with a membership of 1,254. Gratifying, however, as this increase undoubtedly is, the opinion was expressed that there must be in the extensive area of the West Riding a large number of eminently suitable medical men and women whose support might be readily enlisted by the personal efforts of those who have already manifested their interest in the society by their own membership. Forty-five applications for help came before the meeting, and these were all found to be from deserving persons. Some of the applicants have been in receipt of aid for many years, and one for as long as fifty-three years. On this occasion the grants voted amounted to £2,283, and it was further agreed that to mark the occasion of the King's Jubilee a present should be made to each applicant of 10 per cent. of the grant which had been voted. Cases of special necessity which may be brought to the notice of the stewards during the year are dealt with as emergencies, and under the special rule applying to such cases two persons in very straitened circumstances received immediate relief. When the sums which were voted at the annual meeting have been distributed, the Society will have given away in grants no less than £95,968. It has also expended £49,670 during its existence in the purchase of securities of a nominal value of £54,577. Full particulars of membership may be obtained from the treasurer, Dr. Wardrop Griffith, 43, Park Square, Leeds.

Victoria Hospital for Children, Chelsea

During 1934 new sterilizers were installed in the main operating theatre of this institution, a much-needed improvement, since 571 operations were performed there in the twelve months, and the old sterilizers were inadequate. The number of in-patients was 2,565 and out-patients 62,439. In the out-patient theatre there were 2,388 operations. It was deemed advisable to increase the accommodation for infants under the age of 2 years; additional nurses were appointed, and, by reallocation of beds, fourteen more cots were provided. The annual report states that the electric installation in the main building has been re-wired, and special emergency lighting has been introduced into the theatres in the hospital and the Princess Mary Home. In the physiotherapeutic department 7,437 treatments were given, and 7,613 in the artificial sunlight department—the maximum number in each case compatible with the available hospital staff. The private wards for children at 29, Tite Street, adjoining the hospital, were in much demand. As a result of unavoidable additional expenditure the institution closed the last financial year with a deficit of £1,887.

British Red Cross Society

The annual report[1] of the British Red Cross Society shows continued expansion in all sections of the society's work. The number of voluntary aid detachments reached a total of 848, with a personnel of 22,282 members, and there are now four air ambulance detachments. Reference has already been made in these columns to the work of the society's clinic for rheumatism (June 15th, p. 1234). The blood transfusion service received 3,855 calls in the London area during the year, the increase of 838 over the previous year being the highest ever recorded. The number of donors on the roll has increased by 345 to 1,881. The service has received a request from the Italian National Voluntary Blood Transfusion Association to organize a British exhibit at the forthcoming International Blood Transfusion Congress at Rome. The junior branch of the society now numbers 405 "links," with a total membership of 27,470 boys and girls. An upper division membership for those over 14 years has been instituted. The junior courses of instruction have been reorganized, and now provide primary courses on health, simple bandaging, and the elements of invalid care for children under 14; and courses in first-aid, home nursing, and hygiene for boys and girls over 14. The county branches have provided 403 first-aid posts and patrols on the roads and sea beaches, and 914 emergency first-aid stations at large gatherings. The number of medical supply depots throughout the country for the loan of surgical and nursing equipment and for the treatment of necessitous cases has increased to 111.

[1] Report of the British Red Cross Society for 1934. Published at Headquarters, 14, Grosvenor Crescent, S.W.1.

Correspondence

Temperament and Digestive Disorders

Sir,—In your issue of July 20th I described how a particular temperamental type of person could be diagnosed by a combination of psychological examination and the McDougall-Schuster dotting test. I produced evidence that this type of person was found with great frequency among gastric ulcer patients, and suggested that the mode of emotional reaction in such persons was one determinant in the production of gastric ulcer.

Dr. Cawadias claims that gastro-enterologists have studied this question for more than a century, and also regrets that psychologists do not adopt the standpoint of conditioned reflexes.

There is a fundamental difference between our respective outlooks, and the discussion of details is likely to lead nowhere. On my side, although recognizing the value of the study of endocrines and conditioned reflexes by those whose task it is, yet I cannot regard that study as in any way taking the place of the method of approach that I find necessary in my own specialty.—I am, etc.,

London, W.1, July 29th. Millais Culpin.

Future of Irradiation Treatment of Cancer

Sir,—Most people will, I think, agree that the time has now come when there must be special sanatoria for cancer, as suggested by Professor Sidney Russ and others writing in your columns. In these communications, however, no mention has been made of what is already a difficult problem—namely, the shortage of radiologists with a knowledge and experience of radiotherapy. The fact that it is necessary to devote so much time to get good results and the expense of up-to-date machines makes it inevitable that people should think twice before taking up this specialty. If, however, large centres were organized and paid for by public bodies, and if facilities for private practice within the hospitals were allowed, I cannot help thinking that the supply of good radiologists would immediately increase.—I am, etc.,

London, W.1, July 24th. Malcolm Donaldson.

Lederer's Anaemia

Sir,—I should like to congratulate Drs. H. Joules and L. M. Masterman on their paper on "The Acute Haemolytic Anaemia of Lederer" in the *Journal* of July 27th (p. 150), and especially on their careful observations, which indicate that liver therapy is ineffective and that transfusions are curative in this disease. I must point out, however, that they have misquoted my views on this

disease. O'Donoghue and I (*Guy's Hospital Reports*, 1932, lxxxii, 440) explicitly stated that there was much to suggest that Lederer's anaemia occurred in infancy and pregnancy. We excluded such cases from our review because we had no personal experience of them, and because their inclusion would have meant the analysis of a vast and uncritical literature, and not because we disbelieved in their existence.—I am, etc.,

L. J. WITTS, M.D., F.R.C.P.

St. Bartholomew's Hospital, July 26th.

Extrasystoles

SIR,—There are a few points about extrasystoles which Dr. A. G. Gibson did not mention in his excellent paper (*Journal*, July 20th, p. 123). Extrasystoles are commoner in old than in young people, and most old people are unaware of them, but in middle age they often occur in bouts, for no ascertainable reason, and then they *do* give rise to symptoms and call for treatment.

A medical friend of mine was a good deal bothered by extrasystoles following diphtheria. After an inadequate convalescence he returned to a house job at his hospital, and was persuaded one day, against his better judgement, to play several sets of tennis. That night he was troubled by salvoes of extrasystoles as soon as he put his head on the pillow; when he sat up they ceased. Sleep was impossible, so, supposing the symptom to be "functional," he went down to the dispensary and drank a dose of mist. valerian alk. (which contained 15 grains of potassium bromide), after which he slept soundly till morning, and woke up none the worse. Since then he has had bouts of extrasystoles from time to time, maybe when he is driving his car, or when reading in the evening. Sometimes he goes for months without noticing any. The symptoms are a desire to draw a deep breath, and, when frequent, a vague sense of alarm, although he knows (or believes) his myocardium to be sound. He has never been able to discover any cause for these bouts; no food, drink, exercise, or fatigue can be incriminated, and he has given up smoking.

I have notes on two other cases, men of 48 and 56 respectively, each of whom had extrasystoles for several months and then ceased having them. The former had a normal heart, and the latter gross hypertrophy for which I could find no cause (unless he has an adherent pericardium).

The drug treatment of extrasystoles may be very effective. Some cases respond to iodine; but, as always happens with this drug, the optimum effect is seen in a few days, and it is futile to continue it after a week if it has not acted. A more generally useful drug is cinchona (provided the blood pressure is not high); I have not used its derivatives, quinine and quinidine, but they ought to be given a trial. Digitalis may give rise to extrasystoles, but on the other hand it will often cure them, especially in old people with failing hearts. It is fashionable to lay down rules for the use of digitalis, and these have their place, but, like every other drug, it may be tried in any condition, provided it is used with intelligence.

There is a great deal more to be written about extrasystoles; there is a nervous element in some cases. Peripheral stimulus—for example, taking the blood pressure or venipuncture—will produce them in some people, taking a deep breath in others. The important thing to get into our heads is that they *do* matter, they *are* worthy of study, and they *do* deserve treatment. It is true that they have no direct bearing upon prognosis; nor has sciatica. But the doctor whose only treatment for sciatica was to "reassure" the patient would not be very popular.—I am, etc.,

Norwich, July 23rd. FREWEN MOOR.

Air-Raid Precautions

SIR,—The use of air-raid precautions, referred to in your annotation of July 13th, is of great importance to the medical profession, on whom, no doubt, the Government will place the responsibility for dealing with the casualties.

The gesture of taking some active defensive measures may perhaps persuade the public that the subject is receiving official recognition, but no doctor who is familiar with housing conditions in working-class areas, or with the effect of *modern* poison gases, will be deceived for one moment into believing that they are efficacious. I realize that it is of vital importance to avoid a panic, but am equally sure that a moment's thought must prove such measures as have been suggested nugatory. Houses that are not damp-proof are hardly likely to be gas-proof; where overcrowding occurs, as in the case of many industrial areas, the possibility of allocating a room, as suggested by Dr. H. D. N. Miller in the *Journal* of July 20th, is not feasible. I note, further, that the cost is to be £2 per twenty persons; the total cost, therefore, for the population will be in the neighbourhood of five million pounds. He stresses that even this does not protect against a direct hit, and that old people and children may not be able to wear masks.

These measures will not protect against high explosive shells or incendiary bombs, which would be sure to herald an attack, causing fire, breaking windows, and generally rendering useless many of the suggested measures. Moreover, it is an open secret that many of the gases now known eclipse in their horror and lethal action those used in the great war. Respirators alone are useless for Lewisite and caustic gases of that type; gas-proof clothes must be universally provided for such gases, and this is plainly not feasible. No arrangements are made for dealing with transport and nursing. Where a major motor accident causes congestion in most of our hospitals, particularly in urban districts, the accommodation available to deal with a large number of severe and helpless cases in various areas simultaneously offers an enormous problem to local medical organization.

Many will wish to state this, and will feel that the profession should not be used to delude the public into a medical security that does not exist. They know that treatment is at best symptomatic and palliative in these cases, and that there is no real antidote. I am told by experts that if a large force of, say, one hundred planes made a sudden attack and the defence measures were as successful as possible, given the right day at least 50 per cent. would get away, and those that were brought down would still be able to loose their gas bombs. It would seem, therefore, that it is wiser to prevent these pathological conditions (as the *Lancet* suggests) than to cure them; and a little thought must bring home the ultimate inefficiency on medical and psychological grounds of many of the measures suggested in the pamphlet *Air Raid Precautions*.—I am, etc.,

London, W.1, July 22nd. GERALD SLOT.

Injection Treatment of Varicose Veins

SIR,—I have read with much interest the full article on this subject by Mr. Colt and Drs. Isobel Ramsay and Margaret Morrison in the *Journal* of July 13th (p. 49). They are greatly to be congratulated on the vast amount of patient work and on the thoroughness and care with which they have examined the relevant literature. I feel that this article and their conclusions—while I do not agree with them all—will repay the thoughtful study of those of us who seriously practise "veniology."

I should like to make the following observations.

1. *Recurrence of Varicosity.*—We must face the fact that, after a limb has been cleared of all superficial varicosity by injections there will in many cases be fresh varicosity in one to six years. This is due either (*a*) to the appearance of varicosity in non-injected veins (this represents in my experience about 80 per cent. of return cases) or (*b*) to the recanalization of the injected veins (about 20 per cent.). The former is due to the fact that although we have destroyed existing veins by injection and/or ligature we have not, by that process, taken away from the patient his tendency to varicose disease. Having finished the injection treatment, attention must be paid to the question of after-care, and to the important subject of general health (cf. my article in the *Lancet*, September 30th, 1933, p. 753). Local causes—for example, tight garters (men should wear suspender garters), prolonged standing, poor ventilation, exercises, and, above all, diet (more fruit and less meat should be eaten)—are all important factors. The late Professor Sicard, who unfortunately did not live long enough to study late results, strongly emphasized the endocrine basis, and urged the administration of thyroid, etc. Recanalization is, at root, due to the same causes. There are so many diverse factors present in each case that it seems impossible, in considering this question of recurrence, to evaluate the influence of any one element in the technique. No two patients are alike; their occupations, heredity, physique, and reaction to the various sclerosing drugs all vary. It therefore seems to me that veins must be injected, or otherwise treated, by that technique which each operator has found to be best in each given type of case.

2. *Methods Employed.*—I agree emphatically that injections in the standing position are seldom justified. Empty-vein methods, with or without a tourniquet, are best. It is a matter of visualizing the rate of the blood current, the volume of blood, and—what is not stressed in Mr. Colt's article—the thickness or thinness of the vein wall itself. I am sure that this last point, involving as it does poor elasticity of the vein wall, accounts for those very few cases of necrosis that occasionally happen in the hands of even the most experienced. One must, then, visualize all the local conditions, and adjust the dosage to them, and not merely plunge a needle into a vein because it is a vein. I am very glad to observe that bandaging subsequent to injection is recommended in order to diminish the size of the clots, but sometimes—experience decides—more than "light" bandaging is necessary if the patient with big varices is meanwhile to be allowed to pursue his occupation. I am a firm believer in tight bandaging over the site of injection (so as to compress the injected vein) with a short strip of elastoplast. In this way I have, with one injection, occluded with small clots big bulges that the patients' doctors have thought curable only by excision or ligation. Moreover, this tight and local bandaging the more readily secures the "stiction" effect mentioned by Mr. Colt and his colleagues.

3. *"Guidable" Solutions.*—I believe that there are several gates to heaven. I have never been convinced of the merits of salicylate of soda without a local anaesthetic. Mr. Colt apparently likes salicylate of soda, so that his patients can tell him where the pain is and so that he may know how much cure he can expect. It seems to me that this small advantage (if it be an advantage, for cannot one see how much sclerosis has taken place at the next interview?) is largely outweighed by the disadvantage of the patients feeling the cramp-like pain of salicylate, and thus one claim for the injection treatment—painlessness—is thrown away. Moreover, it is very easy for the surgeon to "milk" the injected fluid—"lithocaine" or sodium morrhuate—along neighbouring veins. The original claim made in favour of the absence of a local anaesthetic in the fluid—namely, that the patient would have pain if the needle were not in the lumen of the vein—is, of course, not worth considering if one's technique is properly carried out.

4. *Choice of Solution.*—For the last year I have been using 35 per cent. lithium salicylate with 1 per cent. ethocaine. For most legs I consider this best. It "takes," it "runs," it is "milkable," and it is painless. I am finding, however, that it has one occasional disadvantage which has not, to my knowledge, been hitherto described. I have noticed this in a few cases in which, for the first two or three weeks after the injection, the clots have been small and the vein collapsed, sclerosed, and scarcely perceptible; as the time has increased to seven or even ten weeks, the clots have become bigger (although there have been no further injections into that vein) and the skin over them discoloured, painful, and slightly oedematous. In two cases slight ulceration occurred, the size of three pin-points, with extravasation of blood clot.

5. *Twin Injections in Cases of Non-susceptibility.*—Again Mr. Colt omits from his article any mention of twin injections of incompatible substances from different syringes into the same vein at the same time in cases of insusceptibility of the veins to any one sclerosing fluid. This was first described by Maingot, and I have practised it largely, with good results.

6. *Treatment of Varicose Ulcer.*—Finally, I would join issue very strongly over the Unna's paste casing technique for ulceration. The application of an adhesive cotton-elastic zinc oxide bandage has the added advantage that it exerts a uniform pressure, and rapidly drives out the oedema from the leg (which is the mechanical cause of ulceration), and, by its constant elastic support, provides constant "massage." This was first shown by Dickson Wright in his paper read before the British Medical Association in Winnipeg. Unna's paste and such methods are retrograde steps, and do not yield such rapid results as elastoplast. Such preparations are, from my own personal experience, not as comfortable to wear. Unna's paste casing cannot contract, whereas, as the oedema disappears from the leg with the pressure of the elastoplast, the latter (by its elasticity) contracts, helps by means of its "automassage," keeps the leg thinner, and enables the ulcer sooner to heal.

—I am, etc.,

Liverpool, July 24th. STUART MCAUSLAND.

Recovery after Cardiac Arrest

SIR,—In view of the interest evinced in this subject, the following case of recovery after about four minutes of apparently complete cardiac arrest seems worthy of report.

A married woman, aged 45, of good general health, was admitted to Ancoats Hospital on May 23rd, 1935, for submucous resection of the septum and amputation of a cystic middle turbinal. On the following day, at 4.30 p.m., atropine sulphate, 1/60 grain, was administered hypodermically. Ten minutes later the nose was packed with ribbon gauze, moistened in a solution of equal parts of 10 per cent. cocaine, HCl, and 1 in 1,000 adrenaline. At 4.55 p.m. the administration of general anaesthesia was begun along routine lines—induction by ether and chloroform mixture, followed by the placing of a wide rubber tube in the trachea through a laryngoscope, and the packing off of the pharynx, subsequent anaesthesia being by chloroform, ether, and oxygen vapour from a Webber apparatus. Coughing, retching, etc., had not been marked, there had been no cyanosis, the patient soon settled down, and at about 5.15 p.m. the head of the table was slightly raised and the operation begun.

The anaesthetist, Dr. Marson, from the time his manipulations in the mouth were completed, had followed his usual custom of keeping a finger on the radial pulse, and, this becoming irregular about 5.25 p.m., he changed the anaesthetic to ether vapour alone; but the condition became worse, respirations were shallow and intermittent, and at about 5.28 p.m. the pulse was impalpable, cardiac sounds were inaudible by stethoscope, and the patient apparently dead. At roughly 5.26 p.m. artificial respiration had been begun, the head of the table lowered, and pituitrin 1 c.cm. administered hypodermically; but, there having been no response, mx adrenaline was now injected into the cardiac region through the fourth left costal interspace. At 5.30 p.m., there being still no sign of life, an incision was made through the linea alba, and the heart palpated through the diaphragm. It felt quite flaccid and immobile, and rhythmic massage was begun. After about two minutes without any appreciable result a further mx of adrenaline was injected through the thoracic wall, and some ten seconds later the heart was felt to contract slowly into a hard ball, remain thus for three to five seconds, relax completely again for ten to fifteen seconds, contract again less forcibly than before, relax again, and then begin to beat feebly and irregularly.

The action of the heart rapidly increased, and after some fifty to sixty seconds was regular, but remarkably tempestuous, the pulse at the wrist being reported to be strong and of bounding quality. The patient's colour rapidly improved, respirations soon became satisfactory, and recovery was so complete by the time the abdominal wound had been closed that it was deemed justifiable rapidly to complete the nasal operation under further ether anaesthesia. This was done, and the subsequent history of the patient was virtually uneventful. Recovery from the anaesthesia was not unusual, no neurological symptoms or signs could be elicited at any time, and the patient has showed no more interest in the affair than a fleeting curiosity regarding the presence of an abdominal wound.

The times mentioned are, of course, not perfectly accurate, but are almost so, and are used to give as good an idea of the chronology of events as possible.—I am, etc.,

Manchester, July 24th. NEVILLE YOUNG.

SIR,—In reply to Mr. R. A. Grant (*Journal*, July 27th, p. 186), the cardiac puncture needles were originally made for Sir Francis Shipway, and are obtainable from A. Charles King, Ltd. (34, Devonshire Street, London, W.1). These needles are solid, and resemble large curved suture needles, with a ball fixed to the blunt end for easy manipulation. Some time ago I suggested that hollow needles of similar size and shape should be made to fit a Record syringe. If auricular puncture failed to elicit a response, adrenaline could then be injected without delay through the same needle. I understand that the above-mentioned firm hopes to have these modified needles on sale very shortly.—I am, etc.,

London, N.W.8, July 26th. C. LANGTON HEWER.

Treatment of Puerperal Streptococcal Septicaemia

SIR,—In your issue of July 20th Dr. Leonard Colebrook states: "Dr. Selwood Lindsay, in his paper in the *British Medical Journal* of July 6th (p. 6), offers us two figures in support of his many dogmatic statements." If Dr. Colebrook will do me the honour of reading through my paper with a little more care he will find that, whatever statements of mine he considers dogmatic therein, his own statement is grossly inaccurate.

Dr. Colebrook admits that the difference between my recovery rate for the first series (95.45 per cent.) and his own recovery rate (77.7 per cent.) is "not at all surprising," in view of my statement that the majority of these cases (first series) had become infected during an epidemic in the infirmary, and were therefore "immediately accessible to prompt treatment" (antiscarlatinal serum, *Journal*, July 6th, p. 8). And yet, after giving expression to such an admission, he informs us that he does "not think that Dr. Lindsay's evidence, as given, helps us to form an opinion as to whether the administration of serum played any part in the recovery of his patients"! In other words, while conceding that the main reason for the difference between the two recovery rates is to be found in the accessibility of my cases to prompt serum treatment, he at the same time cannot credit the serum with playing *any part* in my patient's recovery! What, I ask, could be more illogical?

Dr. Colebrook proceeds: "Nor does it [my evidence] suggest that the serum was actually harmful." I quite agree. A figure like 95.45 per cent. recovery *with serum* does not appear to me to lend much support to the opposite view. Dr. Colebrook further states:

> "Our experience at Queen Charlotte's certainly indicates that infections by haemolytic streptococci following normal delivery and treated from the very beginning under the best conditions in hospital (even without serum) are much more likely to remain localized to the genital tract than infections associated with injury following instrumental or difficult labour and not treated in hospital from the beginning."

But while, speaking generally, one would expect bruised tissues to act as a culture medium for infecting organisms, our experience at Belfast Infirmary was that the worst cases of streptococcal septicaemia occurred among patients where the child was born before arrival, *and where little or no evidence of any trauma existed*. Important a factor as local resistance is, general resistance is of still greater importance, and the administration of anti-scarlatinal serum raises this to a higher level. Dr. Colebrook's reference to treatment is extremely vague. Will he kindly indicate precisely the treatment to which he refers?

Dr. Colebrook proceeds in reference to cases of localized sepsis: "*If they do remain thus localized—even if they are infected by haemolytic streptococci—their recovery rate is approximately 100 per cent.*" At Belfast Infirmary our recovery rate among such cases was *quite definitely* 100 per cent.

The number of patients in my second series infected with haemolytic streptococci was seventy-five. Will Dr. Colebrook kindly inform us in how many cases of puerperal haemolytic streptococcal sepsis he administered a dose of not less than 60 c.cm. anti-scarlatinal serum twenty-four hours or less after the onset of an attack, and with what precise results?—I am, etc.,

Belfast, July 22nd. H. F. SELWOOD LINDSAY.

Otogenic Pseudo-Abscess of the Brain

SIR,—In the *Journal* of July 27th (p. 161) Dr. J. B. Horgan records an interesting case of otogenic localized non-suppurative encephalitis, and, like myself, finds himself indebted to C. P. Symonds for drawing attention to this entity. However, within the compass of a letter it is possible only to discuss a few details.

My recent M.D. essay on "Otogenic Brain Abscess" contains, in the section on differential diagnosis, the following brief reference to the complication:

> "This condition is evidently not uncommon among otogenic complications, and it has received attention from Symonds, Mollison, and others. I have reason to believe that it occurred in six of the cases in Series D (fourteen cases for differential diagnostic purposes). I can see no useful means of distinguishing this lesion from abscess (of the brain) in the earlier phases, because the initial pathological changes are probably the same in each, varying only in degree. The tendency is for the non-suppurative lesion to retrogress comparatively quickly (and by this I mean in two to three weeks), and to leave no residual symptomatology. If any residue is apparent, however doubtful, I think the presumption should be that of a localized abscess rather than of the less grave lesion. Atkinson's Cases 24 and 25 were presumably of this nature and he attributes their recovery to wide operative decompression; my own experience is that the passage of a patient suffering from this complication is much less stormy if he is not subjected to trauma arising from intradural intervention."

I may amplify this by the following observations. (1) Dr. Horgan's case indicates that he operated beyond the dura only eight days from the onset of the intracranial lesion. I suggest that this is approximately two to five weeks earlier than such intervention should take place, even in the presence of a suppurative lesion, for the reason that if a patient with a brain abscess cannot survive the first two or three weeks himself, then the surgeon is only likely to hurry the end. There are certain reservations attached to this with which I cannot deal fully here. (2) Experience leads me to believe that a differential diagnosis between the non-suppurative lesion and abscess can seldom be made in as little as eight days. One may suspect, but our proportion of thirty-nine abscesses to six non-suppurative cases (in five years) renders it necessary to bear the latter type in mind. Moreover, such a ratio provides only one of many sound reasons for delayed cerebral intervention in suspected abscess. (3) The last

year has yielded three cases of non-suppurative cerebellar disease, associated with lateral sinus thrombosis, all of which have recovered without intradural manipulations.

Pending later publication of our cases, it is only possible at present to say that one of these was in many respects similar to that recorded by Dr. Horgan.—I am, etc.,

F. M. McGUCKIN, M.D., F.R.C.S.Ed.

Newcastle-on-Tyne, July 29th.

"The Pharmacist as Pathologist"

SIR,—Dr. Crossley-Holland, in his letter (July 20th, p. 138) urging the claims of the pharmacist to receive authoritative sanction to assume the role of pathologist, is unmindful of a fundamental fact that the pharmacist is not trained for such work, nor, would it appear, is the pharmaceutical curriculum adequate or even designed to provide for this difficult and technical pursuit.

It is impossible to conceive how a chemist who has not passed through a course of dissections can pronounce, for example, upon any physical abnormality, or, without any previous study of physiology, become proficient in morbid anatomy. The ramifications of pathology are so wide and intricate, involving as they do the histological recognition of neoplasms, blood counts, gastric and faecal analysis, helminthology, and a most diversified system of ancillary operations, that the demand might be dismissed without further comment. If, as he states, the medical qualification is no guarantee of competency in pathology, are we to understand that a calling not concerned with this subject and its essential and antecedent training is better equipped? He states, too, that much of the work is chemical, for which a chemical training and outlook is required, again forgetful that the doctor also has had a chemistry course as lengthy as, and generally of a higher standard than, the pharmacist. Perhaps here I may be permitted to dogmatize, having passed through both curricula. To assert that pharmaceutical apprentices are engaged during their period of unexpired indenture in the study of chemistry is ridiculous (the claim is sometimes made): it is occupied in pursuit of commerce. Chemistry is by no means the exclusive province of the pharmacist, whose essential and ultimate sphere is the recognition and compounding of drugs.

When Dr. Crossley-Holland speaks of biochemistry, however, he is on entirely different ground. Here, as a technician engaged in the examination of pathological body fluids, the pharmacist with the necessary training is as capable as any other medical or non-medical investigator of submitting to the clinician the results of analysis. Indeed, for this work pharmacy, *as* pharmacy, is quite unnecessary. The technician need know nothing of drugs, the study of which has no relation to the task. It is a truism to say that the ultimate diagnosis does not always rest with the pathologist; yet it often does. Who else may declare *ex cathedra* that certain tumours are or are not malignant? Who else may be positive on a question involving some rare blood diseases but he who has examined the slides? If the pharmacist, or in fact anyone, be competent as a biochemist, his services are not rejected on the grounds that the medical course has not been completed, nor can pharmacists arrogate exclusively to themselves the right to conduct biochemical investigation.

The argument that medicine is rapidly changing is as readily conceded, but as it emerges from its older empiricism, modern pharmacy drifts still further away. Perhaps it is this regretful realization which impels it to clutch desperately at the last vestiges of its medical association. The medical profession may be less self-centred than Dr. Crossley-Holland implies, but in respect of the public I disagree with him in his conclusions; for, no matter how "well informed" it may be, it might look askance at the practice of submitting pus, tonsils, blood, and epitheliomata to the pharmacist for pathological examination.—I am, etc.,

JOHN SHIEL, L.R.C.P. & S., Ph.C.,
Barrister-at-Law.

Dublin, July 24th.

SIR,—In the *Journal* of July 13th (p. 88) there is a letter from Dr. S. C. Dyke in which these words occur: "Most workers in diagnostic laboratories have at one time or another been embarrassed by being regarded as the priests of a peculiar ju-ju which in return for a suitable offering of a piece of meat or a bottle of urine will make oracular utterance."

In these words Dr. Dyke very neatly describes what every clinical pathologist has experienced, and will probably experience more and more while the policy of centralizing pathological laboratories holds the field. This policy makes it necessary for many busy practitioners to send specimens comparatively long distances and to receive reports without consultation with the clinical pathologist, the consequence being that the information obtained from the latter is greatly diminished in value, and may even lead the practitioner astray. This does not mean that consultation is always necessary, but that it is far more frequently called for than the policy of large centralized laboratories permits. A sound man of reasonably good ability near at hand is of more use to the practitioner than a brilliant man a considerable distance away. A consulting pathologist should be consulted, and not merely sent specimens.

As to Dr. F. W. Crossley-Holland's statement (*Journal*, July 20th, p. 138) that "it would be of assistance to the doctor if he could depend upon the pharmacist to undertake certain biochemical examinations," I feel that if stress is laid on the word "depend" little fault can be found with the statement. If the doctor is also to "depend" on the pharmacist to draw conclusions from the results of the laboratory examinations, then much harm will be done, but it is not necessary to be medically qualified in order to make correct laboratory examinations. I am thankful that I am able to "depend" on the examinations made by the very capable technician who assists me—and no doubt other clinical pathologists feel the same—but I interpret the results myself. There are many things a dependable pharmacist might do for the doctor, things that are now all too frequently left undone, but there are many other things for which the help of the clinical pathologist is needed, and it is indeed deplorable that such help is at the present time not far more frequently sought.—I am, etc.,

HAROLD H. SANGUINETTI.

London, W.8, July 29th.

Heat-stability and "Tenacity" of Tuberculin

SIR,—I was much interested in the article by Drs. Parish and O'Brien in your issue of May 18th (p. 1018), in which they advised that special syringes should be reserved for particular dilutions of tuberculin, the syringes being ringed with rubber bands of various colours for purposes of identification. From their experiments this appears to be advisable when using old tuberculin, but I suggest that it is unnecessary when using T.R. or B.E. in treatment, as neither of these tuberculins adheres to clean glass. If a drop of T.R. or B.E. is allowed to dry on a clean glass slide, and then fixed by heat, the tuberculin will not adhere to the glass, as may be proved by the carbol-fuchsine stain. On the other hand, if an albuminized slide be used the tuberculin will stick to the albumin and take the stain.

I had hoped that T.A.F. might prove to be non-adherent. Having filled a 1 c.cm. syringe with T.A.F.

I emptied it, and then twice washed out the syringe with 1 c.cm. of carbol-normal saline. One tenth of a cubic centimetre of the diluent was then drawn into the syringe and afterwards injected intracutaneously into a sensitive patient. There was a +1 reaction, 6 mm. in diameter.—I am, etc.,

London, W.8, July 24th. HALLIDAY SUTHERLAND.

Abdominal Pain in Children

SIR,—The following case, on which I operated this afternoon, prompts me to record an exception to Mr. Rendle Short's experience citing the rarity of appendicular disease in infants (*Journal*, June 8th, p. 1157).

A baby aged 1 year and 11 months was sent by Dr. Wise of Sandwich to the Victoria Hospital, Deal, with a diagnosis of acute appendicitis. There was a vague history of malaise and abdominal discomfort for the previous fortnight and an acute exacerbation of pain the morning of admission.

On examination the child lay quiet and still until the right iliac fossa was touched. The acuteness of response in this area left no doubt as to the condition beneath. The bowel actions were normal.

At operation an appendix two and a half inches long, lying in free thick pus, with general distension and a lymph-covered patch in the middle, was found and removed. Section afterwards showed a gangrenous area about three-eighths of an inch in diameter in the middle, and two concretions but no macroscopic perforation. The appendix was subsequently examined with much interest by my colleagues on the staff, who were impressed by the exact demonstration of a comparative rarity.

I had previously found a swollen and injected appendix in the course of a hernia operation on a child of 15 months. This was regarded as probably of traumatic origin and distinct from the above case, in which no such factor could be discovered.

My chief reason in publishing this case is to oppose the false sense of security among my fellow practitioners, which is always generated by a pleasant generalization in print by an eminent surgeon. Nothing could be more comforting to a harassed medical man than to believe that, excluding intestinal obstructions, abdominal pain in infants may safely be diagnosed as colic and treated with a "wind mixture." I have been so comforted many times in the past, but this personal experience comes as a rude shock; and, as insistence on my previous belief would have meant disaster in this case, it seems rather important to quote exceptions to the rule. Appendicitis in children under 5 years of age is such a fulminating disease that we cannot afford to lull ourselves, and our colleagues who send us the cases, into a false sense of security.—I am, etc.,

Walmer, July 22nd. JAMES S. HALL.

SIR,—I read with interest Mr. Stammers's letter published in the *Journal* of June 22nd (p. 1287), and feel the following case is worth recording:

On July 15th I saw a girl, aged 11 years, who had had abdominal pain and repeated vomiting for twenty-four hours. Her temperature was 99.9° F., pulse 110. Her pain had been epigastric at first, and had then settled in the right iliac fossa, where she was tender, but not very rigid. The psoas and obturator muscle-stretching tests were both positive, and she was tender on the right when examined per rectum. I removed her appendix, which was slightly oedematous. After the operation her temperature and pulse rapidly settled down, and she has had no further pain. When slit open the appendix was found to contain about two dozen active threadworms. There had been no previous symptoms or signs of the presence of threadworms, and none have been observed in the motions since.

—I am, etc.,

Taunton, July 23rd. HERBERT PEARSE, M.B., M.R.C.S.

Malignancy of Vesicular Moles

SIR,—In a letter to the *Journal* of July 6th (p. 38), Professor Dawson of Dunedin, New Zealand, refers to a case of malignant hydatidiform mole producing pulmonary metastases which I demonstrated at the Edinburgh Obstetrical Society (*Edinburgh Med. Journ.*, 1924, xxxi, 217), and which James Young cited at the meeting of the Gynaecological Section of the Royal Society of Medicine on March 15th this year. Professor Dawson is not quite correct when he says that there were pulmonary infarctions present in my case. There were pulmonary metastases visible in the gross as multiple small blood cysts, and these showed on microscopical examination chorionic villi with a connective tissue core and a covering of syncytial and Langhans's cells.

Cases of hydatidiform mole with syncytial metastases in the lung are not very uncommon, as Professor Dawson in his comment (*Proc. Roy. Soc. Med.*, 1930, xxiii, 1158) states. The syncytial masses covering the villi in such cases probably enter the circulation and are carried to the lung capillaries as frequently as is the case in normal pregnancies—according to Schmorl, 80 per cent. in the latter. Syncytial emboli in the lungs possessing destructive properties and producing haemorrhage are another matter. It is a condition much less frequently found. Ewing quotes Fleischmann as recording seven cases of chorioma with cough and haemoptysis, all of which, curiously enough, recovered. As Professor Dawson states, hydatidiform moles possess invasive properties in varying degrees, the degree of malignancy perhaps depending upon the proportion between the epithelia (syncytium and Langhans's cells) and the primitive mesoblastic content of the villi. The peculiar interest of my case is that a typical molar pregnancy developed local and general malignant characters invading the vagina and bladder wall as well as the lungs, and in this invaded tissue villi with primitive connective tissue core and both types of epithelium were found.

For this variety of chorioma with definitely malignant properties Ewing has introduced the term "chorio-adenoma destruens." In my communication (loc. cit.) I ventured to suggest the term "chorio-villoma malignum" as possibly more appropriate. The type in which there are metastatic villi in the lungs is very rare indeed. Into this group my case and that of Solowij (*Monats. f. Geburt. u. Gynäk.*, 1900, xii, 15) come. There are, no doubt, one or two others of the same kind in the literature.—I am, etc.,

JAMES MILLER, M.D., F.R.C.P.Ed.

Queen's University, Kingston, Canada, July 17th.

Treatment of Bacillary Dysentery

SIR,—I have read with great interest the article by Dr. H. W. Corner on this subject in the *Journal* of June 8th. Those without much experience of the subject might be led to imagine that antiserum was the only possible treatment of any avail in this often terrible disease.

In the *Indian Medical Gazette* of March, 1934, will be found a paper by me on "The Acid and Sanitol Treatment of the Intestinal Fluxes." Sanitol, I may mention, is only one of several proprietary preparations of cresol, and was selected because, when fresh, it was found miscible with acid without rapid separation of tarry particles. This treatment is in daily use by me, and my experience of it extends over many thousands of cases. It has not, in my opinion, been given the trial that its merits deserve, possibly owing to the appearance of bacteriophage on the medical horizon; but it should not, on that account, be omitted from "a summary of treatment" of bacillary dysentery.

Dr. Corner was lucky in meeting with a Shiga epidemic, in which the serum is, no one doubts, of great benefit. But Shiga epidemics are not common. In Colombo the Shiga bacillus was only isolated "four times in the last ten years" (*Indian Medical Gazette*, May, 1934). Had the epidemic been due to some other organisms the effect of the serum might well have been very different. Serum will never be efficacious in more than a limited number of cases of bacillary dysentery until it is made more polyvalent, and when this is done its efficacy will be lessened against any particular infection unless the group toxin antibody is strongly represented in the serum.

In Assam, where I have been studying this subject clinically and bacteriologically for many years, the most severe outbreaks in Indians and Europeans appear to be due to various kinds of meta dysentery bacilli, and to other organisms resembling them in their fermentation reactions, but possessing slight motility, at least when first isolated. The most severe dysentery I have ever seen was in a European, in whom such an atypical bacillus was recovered in pure culture. The number of stools was seventy in the twenty-four hours. It is possible that the intestinal epidemic flora may vary in different countries, and there is a great difference between the dry climate of Mesopotamia and the moisture of Assam.

Another point of interest in the paper has been noted: a bluish tinge in the faces of some patients. In the dysentery of the war period in "Mespot" I often noticed that in some severe cases a serous exudation of a definitive mauve tint was exuded from the bowel. This I attributed to a methaemoglobin change. It would be interesting to know if your contributor had noticed this in any of his cases. It may possibly be a characteristic of Shiga infection.

Your contributor seems to be averse to rectal lavage except of water. In a few desperate cases where the acid and sanitol treatment was in danger of failure because of the rapidity of its passage through the bowel (these are the cases of fifty or more motions in the twenty-four hours) I have introduced double doses of the acid and antiseptic mixture per anum, combined with postural treatment, with excellent results. Some of these cases have been in children, always very difficult subjects.

In conclusion, may I emphasize that the treatment I have originated is polyvalent and applicable to any bacillary dysentery, no matter what the causative organism, though, as I have stated elsewhere, there may be a partial exception. In addition, it only costs a few pence. I shall be happy to afford further information to those desirous of an unprejudiced trial.—I am, etc.,

F. J. Palmer, F.R.C.S.I.,
Lieutenant-Colonel R.A.M.C. (ret.).

Hoogrijan P.O., Upper Assam, India, July 7th.

The Services

MEDICAL OFFICERS AS PILOTS

King's Regulations and Air Council instructions have been amended to provide that a medical officer who has qualified as a pilot may, when facilities exist at the unit to which he is posted and provided he is medically fit, keep himself in flying practice. Unless, however, he has flown solo during the preceding three months and has had solo flying experience in the type of aircraft which it is proposed to fly, the commanding officer must ensure that the medical officer receives adequate dual instruction in that type before he flies solo.

DEATHS IN THE SERVICES

Surgeon Commander John Frederick Haynes, R.N., died in the Royal Naval Hospital at Chatham on July 16th, aged 44. He was the elder son of Dr. and Mrs. Haynes of Leamington Spa. After taking the M.R.C.S., L.R.C.P.Lond. in 1916, he entered the Navy, and became surgeon lieutenant commander on October 30th, 1922, and surgeon commander six years later. He served in the war of 1914–18, receiving the medals.

Obituary

HELEN CHAMBERS, C.B.E., M.D.

Pathologist to the Marie Curie Hospital

By the death of Dr. Helen Chambers, which occurred at Kenton, Devon, on July 21st, the medical profession of this country loses an outstanding personality and the cause of cancer research an indefatigable and devoted worker. Only those who were privileged to know her personally can form any estimate of her untiring efforts in the cause to which she devoted her life. In those last words her story may be fairly and literally summed up. It was no case of mere academic interest, but an enthusiastic and ceaseless endeavour to secure the best treatment for women afflicted with cancer. Her connexion with the Medical Research Council and her office as pathologist to the Marie Curie Hospital at Hampstead enabled her to put a vast fund of knowledge to the best practical use. Not gifted with great fluency of speech or facility of writing, she nevertheless achieved success by sheer force of character; writing was always a sore trial, and public speaking was even more repugnant to an uncommonly sensitive and retiring nature.

The wonderful success which has attended the radiation treatment of uterine cancer at the Marie Curie Hospital is a striking example of what can be done by the wholehearted and loyal co-operation of physicist, pathologist, and surgeon, and in this co-ordinated work Dr. Chambers had an enormous share. No trouble was too great in acquiring even the smallest particle of information likely to be of practical service. Visits to hospitals and clinics both at home and abroad were undertaken from time to time, whenever there seemed even a remote possibility of an improvement in technique or of rendering a patient's condition more tolerable; and the magnificent record of treatments at the Marie Curie, of which she loved to talk, was always a source of just pride.

As soon as the treatment of cervical carcinoma had been satisfactorily standardized, the question of breast cancer was the next subject claiming attention. It is well known that the results of radium treatment in cases of breast cancer have not been so eminently satisfactory as those of treatment of uterine cancer; and to collect all available information on this subject was the task which occupied Dr. Chambers up to the time of her death. She had, however, lived to see successful radiation treatment of breast cancer carried out in Professor Coutard's clinic, and only a few months before the end came she was studying his work in Paris, and was, moreover, busily occupied in writing home such accounts of it as might facilitate the introduction of Professor Coutard's methods into this country.

This particular work had a special and personal interest, as embodying in practical form some of the conclusions to which her own experimental studies had led her. This work, which was carried out in conjunction with her friends Professor Russ and Miss Scott, in the Barnato Joel Laboratories of the Middlesex Hospital, was concerned with the production of immunity to subsequent grafts of neoplastic tissue in experimental animals. The matter is one of great complexity and the technical difficulties are enormous, but in some instances successful results were recorded. It was the firm conviction of this band of workers that the dominant essential factor was the exact adjustment of dosage, as regards both wavelength and intensity. Workers with *x* rays and radium have from time to time observed the disappearance of a metastatic deposit as a sequel to the irradiation of a primary growth. These results were, perhaps, generally

regarded as fortuitous coincidences, and attracted comparatively little attention, but they have opened up lines of research which are full of promise for the future.

Only a fortnight before her death Dr. Chambers, in collaboration with Professor Russ, contributed a paper on "The Principles of Radiological Treatment and their Bearing on Hospital *X*-Ray Organization" to this *Journal*. It was a fitting conclusion to a life devoted to the welfare of others. The idea of self always appeared to be entirely eliminated, and her only interest was the promotion of the cause to which she devoted her life. If the profession has lost a research worker and organizer of outstanding ability, those who were associated with her in their work are only too acutely conscious of the passing, not only of a very loyal colleague, but of a very dear friend.

Helen Chambers received her professional education at the London School of Medicine for Women, passing the M.B. examination of the University of London in 1903, when she obtained the gold medal in forensic medicine and first-class honours in obstetric medicine; the M.D. was taken (in pathology) in 1908. In 1915 she resigned the post of pathologist at the Royal Free Hospital in order to take a similar office at the Military Hospital in Endell Street, where her advice was eagerly sought by her colleagues, not only in her own specialty but in many and varied branches of clinical work. For her services in this connexion she was awarded the C.B.E.

JOSEPH HUNTER, M.B., CH.B., D.P.H.

M.P. for Dumfriesshire

We regret to record the sudden death, on July 24th, of Dr. Joseph Hunter, Liberal M.P. for Dumfriesshire since 1929, at the age of 59. Before the Parliamentary stage of his useful life he had rendered devoted service to the town of Dumfries and to the British Medical Association.

Joseph Hunter was born in Dumfriesshire in 1875, and received his education in Edinburgh and at University College, London. He graduated M.B., Ch.B. in 1898, and obtained the D.P.H.Camb. in 1902. His first appointment was that of resident physician to the Royal Infirmary, Edinburgh, and he later took part in the South African War as a civilian surgeon in the South African Field Force, returning with the Queen's medal and four clasps. After a period of study in London he went to Dumfries, where he rapidly secured a large practice, and became medical officer of health for the burgh, physician to the Dumfries and Galloway Royal Infirmary, and medical officer to the prison. He had joined the British Medical Association in 1903, and was secretary of the Dumfries and Galloway Division in 1922–3, and chairman in the following year. He was a member of the Representative Body at the Annual Meetings of the Association in London, 1919; Cambridge, 1920; Newcastle-upon-Tyne, 1921; Portsmouth, 1923; Nottingham, 1926; and Manchester, 1929; and he served on the Scottish Subcommittee from 1920 to 1922, and the Scottish Committee from 1920 to 1924.

Dr. Hunter had always shown a keen interest in politics, but it surprised many of his friends when, in 1926, he gave up his very large medical practice for an administrative post with the Land and Nation League, at the instigation of Mr. Lloyd George and Lord Beauchamp. Three years later he was elected M.P. for Dumfries, in the course of the great Liberal campaign which he had helped so energetically to organize, and he was Scottish Liberal Whip from then until 1931, when health reasons compelled him to withdraw. At the election campaign in that year the devoted efforts of his wife assisted him to retain the seat by a majority over his Labour opponent of more than 19,000 votes. The break between the two sections of the Liberal Party distressed him intensely, and until 1934 he occupied a detached position in the Party, but in June of that year he was appointed organizer for the Simonite group, with a view to consolidating Liberal support for the National Government. Despite the poor state of his health, which had been weakened by his energetic participation in political work, he took up the task with enthusiasm, visiting many parts of the country in his efforts to build up an efficient fighting organization. The strain proved too great, however, and anxiety had long been felt for his future. Dr. Hunter was one of the most popular members of the House of Commons, where his sincerity and energy, combined with great personal charm, won him the affection and respect of all parties. In 1918 he married Miss Jean Augusta Maclean of Nova Scotia. He leaves one son and two daughters.

Dr. EDWIN ALBERT CHILL, O.B.E., who died suddenly at his residence in Battle, Sussex, on July 23rd, had been well known in Middlesex as well as Sussex as an enthusiast for ambulance work. He was born in Burma in 1861, and educated in Edinburgh, London, and Dublin. He graduated M.B., C.M.Ed. in 1883, and proceeded M.D. in 1886. His earlier appointments included those of surgeon to the Frome Victoria Hospital (1898–1905) and senior clinical assistant to Great Ormond Street Children's Hospital and the London Throat Hospital (1906–8). He practised in Ealing, and was for many years surgeon to the Ealing School Clinic, which he joined in 1912. He was medical examiner to the Territorial Force Association from 1914. During the war he held a commission in the R.A.M.C., and was attached to the R.A.S.C. He was chief V.A.D. commissioner for the central division of Middlesex, and was officer in command of the Auxiliary Military Hospital, Southall. For many years a lecturer and examiner in the St. John Ambulance Brigade, he was made an honorary life member, an associate, and, still later, a Commander of the Order of St. John of Jerusalem. When he retired to Battle he was appointed county commissioner for Sussex of the St. John Ambulance Brigade. He joined the British Medical Association in 1891, and was a representative at the Annual Meetings of the Association at Nottingham in 1926 and Edinburgh in the following year. He was a Fellow of the Royal Society of Medicine, and a member of the West London Medico-Chirurgical and Ealing Scientific Societies. Dr. Chill had been a great traveller in his earlier years, and his interests were wide, including particularly children's diseases and affections of the ear, nose, and throat; anthropology; and Freemasonry. He was a well-known lecturer, and had published books on anthropology, the Maoris, and erythromelalgia.

The following well-known foreign medical men have recently died: Dr. KRAMER, professor of neurology and director of the neuro-chirurgical hospital at Moscow, aged 59; Professor BUCHSTAB, formerly director of the therapeutical clinic of the Institute of Medicine at Odessa; Professor GAETANO FICHERA, director of the Cancer Institute at Milan; Professor EMIL KNAUER, head of the University Women's Clinic at Graz, aged 68; and Dr. ROBERT PROUST, professor of clinical gynaecology in the Paris Faculty.

We regret to announce the death of Dr. W. HOWARD JONES, anaesthetist and lecturer on anaesthetics at Charing Cross Hospital; and of Dr. M. G. BIGGS, who was for many years a prominent figure in the work of the British Medical Association, serving as chairman of the Central Ethical Committee in 1913–19. Obituary notices will appear in a later issue.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Robert Knox, M.A.Oxf., M.D.Lond., and G. P. McCullagh, M.D.Belf., have been appointed university demonstrators in pathology for three years from October 1st.

The Marmaduke Sheild Scholarship for 1935 has been awarded to G. W. Harris, B.A. (Emmanual).

UNIVERSITY OF LONDON

The Senate on July 17th awarded the degree of Ph.D. in Bacteriology to C. E. Dolman, M.B., B.S., D.P.H. (University of Toronto), and S. S. Bhatnagar, M.R.C.S. (Lister Institute of Preventive Medicine).

University College Hospital Medical School

The following awards of scholarships, exhibitions, and prizes have been made for 1934–5: *Goldsmid Entrance Scholarships*, G. M. Little, J. I. P. James. *Goldsmid Entrance Exhibition*, J. D. N. Nabarro. *Filliter Entrance Scholarship in Pathology*, R. W. W. Brown. *Atchison Scholarship*, E. E. Pochin. *Atkinson Morley Scholarship and Magrath Scholarship*, M. C. Chapman. *Filliter Exhibition*, awarded jointly to J. S. Horn and S. Yudkin. *Liston Gold Medals*, H. A. Oatley, I. Illingworth-Law. *Alexander Bruce Gold Medal*, D. A. Sanford. *F. T. Roberts Prize in Obstetrics and Gynaecology*, H. H. F. Barns. *Fellowes Gold Medal*, W. R. Merrington. *Fellowes Silver Medals*, H. M. Sinclair, J. F. Stokes. *Erichsen Prize*, I. Illingworth-Law. *Tuke Bronze Medals*, Miss E. Woodford-Williams, Miss F. C. Poles. *Junior Clinical Surgery Prizes*, I. Illingworth-Law, K. J. Mann. *Ferriere Scholarship*, J. I. P. James. *Bilton Pollard Fellowship*, J. C. Hawksley, M.D., M.R.C.P.

King's College Hospital Medical School

The following scholarships have been awarded at King's College Hospital Medical School: *Senior Scholarship for General and Clinical Work*, J. V. Dacie. *Burney Yeo Scholarship*, A. H. Baynes (Gonville and Caius College, Cambridge). *Burney Yeo Exhibitions*, E. B. G. Reeve (Oriel College, Oxford), R. R. Wethered (Worcester College, Oxford). *Raymond Gooch Scholarships*, E. Cohen (Queen's College, Cambridge), J. H. Whittles (King's College, London). *Epsom College Scholarship*, J. M. Watson (Trinity Hall, Cambridge). *Anatomy and Physiology Scholarship*, divided equally between N. L. Crabtree (King's College, London) and B. H. Price (St. John's College, Cambridge). *Science Scholarship*, T. H. E. Richards (St. Olave's Grammar School).

St. Thomas's Hospital Medical School

The following scholarships have been awarded: *Entrance Science Scholarships*, L. B. Scott and D. R. Christie (equal).

The following candidate has been approved at the examination indicated:

M.S.—*(Branch I, Surgery)*: T. F. Todd.

UNIVERSITY OF MANCHESTER

Dr. James Davson has been appointed demonstrator in pathology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a meeting of the Royal College of Physicians of London on July 25th, with the President, Lord Dawson of Penn, in the chair, the following were elected officers for the ensuing year: *Censors*, Sir Arthur John Hall, Gordon M. Holmes, H. Letheby Tidy, C. E. Lakin; *Treasurer*, Sidney P. Phillips; *Registrar*, Sir Raymond Crawfurd; *Harveian Librarian*, Arnold Chaplin; *Assistant Registrar*, C. E. Newman.

Lord Dawson was re-elected the representative of the College on the Governing Body of the British Post-Graduate Medical School.

The President announced the award of the Baly Medal to Dr. F. H. A. Marshall as a pioneer in the experimental investigation of sexual physiology and the relation of hormones to it; and the award of the Bisset Hawkins Medal to Sir George Newman for his distinguished services to public health, and more particularly for the leading part played by him in the institution of social medical services.

Appointments

The following appointments were announced: Sir Walter Langdon-Brown as Harveian Orator, 1936 (the forthcoming Harveian Oration in October next will be delivered by Sir Henry Dale, F.R.S.); Dr. Edward Mapother as Bradshaw Lecturer, 1936; Dr. E. L. Middleton as Milroy Lecturer, 1936; Dr. R. A. McCance as Goulstonian Lecturer, 1936; Dr. John Parkinson as Lumleian Lecturer, 1936; Dr. Joseph Needham as Oliver-Sharpey Lecturer, 1936; Dr. J. D. Rolleston as FitzPatrick Lecturer, 1936; Dr. R. R. Traill as Mitchell Lecturer, 1936; and Dr. Edwin Bramwell as Croonian Lecturer, 1937.

The Murchison Scholarship was awarded (by the University of Edinburgh) to W. M. Wilson.

Leverhulme Scholarships were awarded to Dr. R. L. Noble and Dr. C. C. Ungley; a grant from the same fund to Dr. Janet Vaughan to continue the work on which she was engaged before relinquishing her scholarship; and the re-appointment for six months of Dr. E. G. L. Bywaters and Dr. L. C. Bousfield as Mackenzie Mackinnon Scholars.

Membership

The following candidates, having satisfied the Censors' Board, were admitted Members of the College:

H. E. Appleyard, M.D.Univ. W.Ont., A. H. Barber, M.B.Birm., R. F. Barbour, M.B.Ed., A. E. Barclay, M.D.Camb., C. G. Barnes, M.D.Lond., W. A. Caldwell, L.R.C.P., D.P.M., R. N. Chopra, C.I.E., M.D.Camb, Lieut.-Colonel I.M.S. *(in absentia)*, J. F. Coates, M.D.Bristol, C. C. Cobb, M.B.Oxf., Squadron Leader H. W. Corner, M.D.Aberd, R.A.F.M.S., J. E. Debono, M.D.Malta, M. E. Disney, M.B.Lond., G. A. Emmerson, M.B.Camb., C. E. Garson, M.B.Madras, P. K. Ghosh, M.B.Calcutta, V. R. Ginde, M.B.Bomb., S. A. Hasan, M.B.Punjab, M. Hashem, M.B.Cairo, M. I. A. Hunter, L.R.C.P., B. S. Jirge, M.B.Bomb., J. H. Kelligren, M.B.Lond., M. J. F. McArdle, M.B.Lond., T. C. Maling, M.B.Camb., M. W. Miller, M.B.Adelaide, W. D. Newcomb, M.D.Camb., D. N. Parfitt, M.D.Lond., A. S. Paterson, M.D.Ed., H. E. S. Pearson, M.B.Lond., S. A. Propert, B.Ch.Camb., K. Robson, M.B.Camb., S. K. Sen, M.B.Camb., M. J. Shah, M.B.Bomb., E. P. Sharpey-Schafer, L.R.C.P., P. McI. Smyth, M.B.Camb., A. C. Stevenson, M.B.Glas., M. L. Thomson, M.B.Aberd., H. A. Treble, M.B.Oxf., R. Whishaw, M.B.Sydney, A. Willcox, M.B.Camb., M. Williams, L.R.C.P., R. P. Williams, M.D.Lond., Mary J. Wilmers, M.B.Lond., J. C. Winteler, M.B.Lond., G. P. Wright, M.D.Oxf.

Licences and Diplomas

Licences to practise were conferred upon the following 205 candidates (including twenty-two women) who have passed the final examination of the Conjoint Board and have complied with the by-laws of the College:

H. L. Ackerman, S. N. Ahmed, S. G. Alavoine, H. F. Anderson, S. O. Aylett, P. H. Ball, H. D. G. Barnes, Mary J. Bartlett, R. D. I. Beggs, D. Bhatia, K. O. Black, B. E. Blair, F. L. Bland, A. C. Blandy, Katherine M. Blenkin, N. H. Bloom, A. S. Bookless, F. Braithwaite, W. G. Brander, Margaret C. Briggs, Margaret Brodigan, A. J. Broomhall, E. A. E. A. Brown, J. L. Brown, K. P. Brown, L. H. Buckland, Kathleen E. Burnell, E. W. Burstal, H. A. Burt, J. H. Caverhill, H. G. Cereseto, J. Charnley, P. W. Clarkson, J. G. Clothier, J. H. Cobb, B. Cohen, G. H. Collier, C. D. Coole, A. H. Cooke, J. T. Corbett, R. F. Courtin, D. Craig, J. M. Cribb, G. F. Crickmay, Annys M. Cusack, G. Dalley, V. R. Damle, D. V. Davies, D. W. Davies, R. D. L. Davies, W. J. F. Davies, A. B. Dempsey, T. Denness, W. H. H. J. De W. De Wytt, L. D. P. Dharmaratne, C. W. Dixon, R. C. Dolly, E. W. Dorrell, J. F. Dow, Jean Duncan-Whyte, L. S. Dymond, K. G. Eckersley, J. E. Elliott, G. D. Elphick, M. Epstein, N. P. Eskell, E. W. R. Fairley, Dora J. B. Falconer, I. A. Feldman, Annie Fidler, J. G. Field, E. L. Fisher, C. S. Ford, I. M. Fradkin, O. P. Frank, M. Frohlich, J. G. Garman, J. H. Garnett, K. D. Gibson, B. M. Goldsworthy, J. F. Goodall, C. N. Gosse, D. R. Gray, Gladys J. Greenhalgh, C. U. Gregson, G. S. C. de S. Gunasekera, Irene G. Hamilton, D. R. Hanbury, D. T. K. Harris, M. J. Harris, W. N. L. Haynes, Sylvia A. M. Herford, N. J. P. Hewlings, C. C. Houghton, D. M. Hughes, T. P. E. Hughes, C. S. Humphries, H. B. Hunt, M. I. Husain, N. W. Irish, E. C. O. Jewesbury, H. D. Johnson, S. J. Johnson, S. A. Jones, H. S. Joseph, S. Kaufman, A. R. Kelsall, T. B. Kenderdine, A. R. Kennedy, A. S. Kerr, A. A. Khan, F. J. D. Knights, M. J. Lange, R. B. Leech, P. H. Lenton, M. J. Levi, H. Levitt, J. Ll. Lewis, P. T. Liem, C. A. Lillicrap, W. L. Lister, O. Lloyd, O. G. Lloyd, J. F. Loutit, A. C. Maguire, J. I. C. Mason, D. N. Matthews, W. d'A. Maycock, Ellen Mayer, W. R. Merrington, S. Meyers, I. H. Milner, C. R. Morison, L. F. Muldavin, N. W. N. Murray, W. G. Murray-Browne, M. L. Nairac, J. B. Neal, H. Nicholson, B. P. Niyogi, A. J. Owston, J. G. Parekh, Maude A. Parfitt, W. D. Park, J. N. Parker, D. N. Parry, P. S. Patuck, Mary M. Paulosky, G. E. Paxon, G. W. V. Pegge, A. D. Petro, E. H. D. Phillips, R. M. G. Pole, A. R. Pope, R. J. Porter, I. H. Premdas, J. S. Price, W. A. Pritchard, D. A. Prothero, S. A. Qadri, B. K. R. Rao, R. G. Record, S. J. R. Reynolds, E. A. Richards, K. E. O. Ringdahl, B. Roberts, Hilda Roberts, R. E. Rodgers, P. W. D. Russell, J. P. Salkield, R. G. Samuel, R. S. Saxton, M. Schlaff, J. Schofield, P. G. Scott, C. Segaloy, G. N. Sen, H. J. Sherren, S. G. Shippard, N. S. Shtetinin, A. Smiter, G. C. Smith, Elsie M. Smyth, S. J. Stein, Eunice F. Sterling, J. M. Stewart, A. Stoller, D. W. L.

Thomas, H. C. Thomas, S. M. Thompson, J. D. B. Vaile, W. H. Valentine, Constance M. Vallange, P. W. Vilain, A. Wardale, M. Watkins, Elizabeth H. Western, B. L. Williams, Eugénie L. Willis, A. B. Wilson, J. S. H. Wilson, G. N. M. Wishart, Rowena Woolf, G. F. Wright, H. Yarrow.

The following diplomas were also conferred jointly with the Royal College of Surgeons:

DIPLOMA IN ANAESTHETICS.—R. E. Apperley, H. E. G. Boyle, E. G. Bradbeer, G. Brown, R. Brown, C. H. Budd, J. M. Clark, H. P. Crompton, A. S. Daly, F. T. Evans, H. W. Featherstone, E. W. Gandy, C. F. Hadfield, C. L. Hewer, J. B. H. Holyroyd, A. E. W. Idris, R. W. Ironside, W. H. Jones, N. McDonald, H. J. Macvean, I. W. Magill, A. D. Marston, Helen S. Mason, Z. Menneil, A. Mills, R. J. Minnitt, C. W. Morris, A. J. O'Leary, W. J. Phillips, R. K. Robertson, H. Sington, G. F. R. Smith, A. Sunderland, W. S. Sykes, F. Whalley.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.—K. B. Armstrong, F. G. Fenton, N. W. Gardener, P. K. Guha, M. A. L. Hassouna, T. H. Hodgson, R. H. Hucknall, G. A. Jamieson, H. Lipschütz, M. C. Mankodi, J. R. Mutch, S. Pearlman, Violet M. Phelps, H. L. Shankman, S. K. Sledge, A. McL. Thomson, T. H. S. Tizzard, S. D. H. D. Wallis.

DIPLOMA IN MEDICAL RADIOLOGY.—Christine C. Abernethy, D. Hugo, D. J. Thomas.

The names of the recipients of the Diplomas in Public Health (10), Tropical Medicine and Hygiene (17), Psychological Medicine (11), and Laryngology and Otology (4) were published in the report of the meeting of the Royal College of Surgeons of England in our issue of July 20th (p. 141).

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A meeting of the Council was held on July 25th, with the President, Sir Cuthbert Wallace, in the chair.

The President stated that, after the Primary Fellowship Examination which will be held at the end of this year, the next examination in India will not take place until 1937. Mr. G. Gordon-Taylor will take Mr. C. P. G. Wakeley's place as an examiner for the Primary Examination for the Fellowship to be held in Calcutta in December.

Diplomas of Membership were granted to 198 candidates, whose names are published in the report of the meeting of the Royal College of Physicians of London in this issue, as are the names of the recipients of the Diplomas in Anaesthetics (35), Ophthalmic Medicine and Surgery (18), and Medical Radiology (3).

Recognition of Hospitals

The following hospitals were recognized for the Final Examination for the Fellowship: West London Hospital (three house-surgeons); Woolwich and District War Memorial Hospital (senior resident medical officer and one house-surgeon); Radcliffe Infirmary, Oxford (resident surgical officer and one house-surgeon); Cornelia and East Dorset Hospital, Poole (one house-surgeon); Swansea General and Eye Hospital (senior resident medical officer and three house-surgeons).

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—G. B. Barbour, A. H. el S. el Mahallawy, A. Morgan, A. Ponder, K. G. Wrigley.

MEDICINE.—G. B. Barbour, H. N. Davis, E. M. Frankel, E. T. Garthwaite, N. O. Lucas, J. B. Mair, K. P. Pauli, G. N. Rodgers.

FORENSIC MEDICINE.—G. B. Barbour, H. N. Davis, E. M. Frankel, J. B. Mair, G. N. Rodgers.

MIDWIFERY.—A. Aspinall, A. N. Coomboo, G. R. Hopper, F. W. Treadwell.

The diploma of the Society has been granted to A. Aspinall, E. T. Garthwaite, A. H. el S. el Mahallawy, J. B. Mair, K. P. Pauli, A. Ponder, F. W. Treadwell, and K. G. Wrigley.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The summer recess of Parliament was arranged from August 2nd to October 29th, after which the business of the session will be completed.

In the House of Commons on July 25th the Assurance Companies (Winding Up) Bill was read a second time. It received a third reading on July 26th. The Restriction of Ribbon Development Bill was read a third time by the Commons on July 29th.

The St. Bartholomew's Hospital Bill was read a third time, with amendment, in the House of Commons on July 25th.

Bills which have received a third reading in the House of Commons include: July 24th, Government of India Bill and Cuddington Joint Hospital District Bill; July 25th, Housing (Scotland) Bill and Hours of Employment Conventions Bill; July 29th, Public Health (Water and Sewerage) (Scotland) Bill.

The Lords agreed on July 25th to the amendments made by the Commons in the Criminal Lunatics (Scotland) Bill.

The National Health Insurance and Contributory Pensions Bill passed report stage in the Lords on July 29th.

An Order in Council approving amendments to the Dental Board's Regulations was laid on the table of the House of Commons on July 29th.

Sir Francis Fremantle presided at a dinner given at the House of Commons on July 31st to Mr. J. G. Kerr and Mr. K. W. M. Pickthorne, new members respectively for the Scottish Universities and for Cambridge University.

The Minister of Health has announced no decision regarding adoption of the Medicines and Medical Appliances (Advertisement) Bill.

A return relating to experiments on living animals was laid on the table of the House of Commons by Captain Wallace on July 30th.

Review of the Health Services

The estimates for the Ministry of Health were presented to the House of Commons on July 17th by Sir Kingsley Wood. Sir KINGSLEY said the Ministry asked approval for a total net estimate of £20,102,000, an increase of £313,000 on last year. The greater part of the increase was due to slum clearance work and the rest to the cost of administration. Reviewing some of the main developments in public health during the last twenty-five years, he said that no fewer than 100 Acts of Parliament had been placed on the Statute Book which bore upon public health. The national conscience on health and housing matters had been awakened. The public showed greater common sense in health matters, in clothing, diet, in the increasing use of daylight, open air, leisure, and recreation. To many people in this country life was becoming longer and better. In 1910 the death rate for all ages in England and Wales was 13.5 per 1,000 persons, and 95,000 infants died under 1 year of age. Last year the total death rate fell to 11.8, and the loss of infant life under 1 year was reduced to 35,000. The growth of knowledge in medicine and surgery through all that period had been continued. Typhoid fever had been brought under control. The discovery of insulin had revolutionized the treatment of diabetes. Orthopaedic surgery had prevented the onset of crippling, and the cripple to a large extent had been eliminated from the modern world. Great discoveries had been recorded in neurology and heart disease. Cancer, however, accounted for some 60,000 deaths last year. They had fresh hopes that with the increasing employment of radium and *x*-ray therapy something further might be done with this disease. He hoped that during the next decade a cure would be found for the common cold, which was regarded by many as "Public Health Enemy No. 1." The national health insurance scheme had been a remarkable development of the last twenty-five years. The value of benefits disbursed since 1911 was £480,000,000. In the last ten years over £150,000,000 had been disbursed on statutory sickness and maternity benefits, and over £90,000,000 in medical benefits. The scheme had survived the depression and unemployment of recent years, and had stood the test of three valuations and an expenditure of £53,000,000 in additional benefits. Of this, over £26,000,000 had been devoted to benefits of a medical character and £20,000,000 to dental benefits. The

British national insurance system had been adopted by twelve other countries, from Norway to Japan.

There was the unsolved problem of the unreduced maternal mortality rate. The Departmental Committee which reported in 1932 inquired into nearly 6,000 maternal deaths, and suggested that at least one-half of them might be prevented. In West Ham, a poor borough, with a population of over 280,000, the maternal mortality rate over the period 1924-33 was 2.48 per 1,000 births. In Nottingham, a borough better off in many respects and with practically the same population, it was 3.74; in Westminster it was 5.63; in Marylebone 3.78; in Kensington 3.51; in Hampstead 3.48; and in Poplar 2.63. There had been no relaxation on financial or other grounds of the efforts made to deal with this problem by those responsible for maternity and child welfare services. In the last three years the visits paid by health visitors to expectant mothers showed an increase of 60,000; 240 ante-natal clinics were provided, and the number of women who attended those clinics rose by 49,000. The number of women admitted to maternity beds in institutions provided or subsidized by local authorities rose to 29,000. It was essential to persevere in the intensive investigation of the causes of maternal mortality. Special inquiries were now proceeding by medical officers of the Ministry of Health with the assistance of a specialist.

Turning to housing, Sir Kingsley Wood said that the number of houses built in the year ended last March was 325,000, compared with 127,000 houses which marked the peak-year output before the war. New houses for slum replacement had been sanctioned during the first half of 1935 at the rate of over 6,000 a month in England and Wales, and at the end of June nearly 100,000 houses had been approved for this purpose, of which some 50,000 for about 240,000 persons had been completed. Nearly 90 per cent. of the houses provided in England and Wales from March, 1931, to March, 1935, were under £26 per annum rateable value in the provinces and £35 per annum in London.

Opposition Amendment

Mr. ARTHUR GREENWOOD moved to reduce the estimate by £100. He regretted that the Minister had not explained why there were 500,000 more people on the Poor Law than four years ago, and had said nothing about malnutrition. Of 75,817 houses of rather larger type built by private enterprise during the half-year ended March, 1935, the number occupied by persons other than the owners was only 12,796, and that in the same period only 5,500 houses had been built to let under guarantees by building societies. The country was faced with a more serious housing problem than it had in 1931.

Maternity Services

Mr. JANNER said it was essential when drawing public attention to the dangers of maternal mortality not to create the impression that child-bearing in itself was dangerous. Could the House be told how many reports had been received from medical officers of health on the measures taken in their districts for the provision of a midwifery service for all confinements, the provision of adequate beds for the isolation of cases of puerperal sepsis, and the arrangements for consultant services in difficult cases? What remedial steps had been or were being taken on these reports? A circular issued in October of last year, which asked all maternity and child welfare authorities to make an urgent survey of their services, had stated that 174 authorities out of 421 had reported that they did not propose improvements although twenty-three were regarded as not reasonably complete, and eighty-four authorities promised attention. There was a strong feeling that post-graduate courses should be generally provided for practising midwives; that the salaries of midwives should be much higher; that midwives in rural areas should be subsidized and their numbers increased; that a doctor should be employed in every case, even though there might not be complications in the first instance; and that the services of obstetrical specialists should be available for all pregnant women. Dr. Veitch Clark had emphasized that midwives should form part of the extern practice of the maternity units of hospitals. They should be linked up with the other services, such as the ante-natal and post-natal clinics. Dr. Veitch Clark said there had been a fourfold increase in ante-natal work in Manchester during the last four years. Over 50 per cent. of the women were now seen ante-natally by the public medical service, and this increase and supervision had coincided with the fall in the death rate from puerperal sepsis from 1.7 to 1 per 1,000. He thought those factors were associated, and that ante-natal supervision had contributed in a reduction to the toxaemias of pregnancy.

Sir FRANCIS FREMANTLE paid tribute to the work of Sir George Newman, and asked whether the status of the new Chief Medical Officer remained unimpaired as a secretary in the Ministry of Health with direct access to the Minister. Twenty-five years ago the prevalent idea was that infectious disease was due to a microbe, and all that had to be done was to find the microbe and destroy it by inoculation, disinfection, or some other way. In order to exterminate the microbe they isolated the patient. Since then it had been shown that the disease germ might exist in healthy carriers. The condition had been studied under which the microbe sometimes seemed to do no harm and at other times was brought into activity by a cold, a chill, or something. It was the "soil" and the variation in the "soil" that mattered. The aim was to improve the physique and health of the individuals that made up the population. The Ministry of Health, through the local authorities, had the means of promoting physical health. Referring to the question of nutrition, Sir Francis said that under-nutrition, particularly among mothers, was bound to affect the next generation. But a systematic survey made under the Ministry of Health had shown little evidence of the actual increase of ill-health, mortality, or infectious sickness. That their anxieties were false had been shown by medical inspection in the schools of depressed areas. Malnutrition had been found in families and districts where less attention was paid to the preparation of food, and the deficiency was not a consequence of lack of means to buy food. A departmental committee had reported not long ago on the composition and description of food, and he would like to know if anything was being done on that report. Ability to cook food, however, was more important than the selection of proper food. He feared a generation had grown up which was ignorant of the art of cooking. Turning to maternal mortality, he said that much would have to be done to advance the profession of the midwife. At present there was no incentive to girls leaving school to go in for midwifery. In Rochdale, for the three years 1929-31 the rate of mortality had been 10 per 1,000 births registered—over double what it was for England and Wales generally. During the intensive campaign in the years 1932-4 the rate was reduced to 3.9. In the Rhondda Valley a special campaign began eighteen months ago. In the first nine months there were twenty-nine deaths, in the next three months there were only six, and the next six months there had been only six more. Mortality had been reduced to a third by paying attention to what everyone ought to pay attention to in the matter of confinements. Results could often be secured by using existing machinery, but they had to bring together the machinery and an elastic mind.

Mr. WEST said that Kensington was one of the blackest spots in Britain from the housing and health point of view. The infantile mortality in that borough last year was 93 per 1,000, which was 50 per cent. worse than the average for London. The death rate in North Kensington was 102 per 1,000, compared with 62 per 1,000 in Poplar and 54 per 1,000 in Hackney. For the last ten years North Kensington and Kensington had been enormously above the average rate for London and for Britain. One or two wards in Kensington last year had a death rate of 120 per 1,000. Not only the infantile death rate, but the diseases rate in respect of tuberculosis, fever, diphtheria, and pneumonia, averaged from three to five times that for London. On housing the total expenditure of Kensington last year was less than one-third of the penny rate, and their five-year housing plan amounted to eighty houses. There was ground for inquiry by the Minister in Kensington.

Malnutrition in Children

Dr. ADDISON remarked that Sir George Newman, in his report on the school services in 1933, had warned them that the physiological deterioration of the unemployed might appear at any time, although it had not yet in any general degree appeared. Dr. Addison believed that since that warning evidence had accumulated that the deterioration Sir George Newman foresaw was now emerging. It began to

appear gradually among children at 2 to 5 years, so that by the time the child was old enough to go to school one found something distinctive as a result of four years of national economy at the expense of the unemployed. The medical officer for Breconshire examined 2,000 children in fifteen schools in July, 1934. He found that children of 5 classified as being underweight from depressed areas numbered half as many again as those from the areas not regarded as being depressed. In Burnley the medical officer reported that the percentage of malnutrition in children had risen from 1.4 per 1,000 in 1929 to 8.3 in 1933, notwithstanding provision of free meals. The Preston medical officer reported that the industrial situation had deprived people of first-class proteins, fats, and vitamins. Bread, jam, margarine, and tea had taken the place of milk, meat, eggs, and fresh fruit. In districts where unemployment was most marked effects of poverty were reflected in every part of the school. Taken as a group the children were undersized, pale, listless, flabby, and mentally dull. The Pontypridd medical officer's report stated that long-continued unemployment had made large numbers of families dependent upon transitional payments or public assistance, and there was imminent danger of the continued low level of subsistence leading to malnutrition and physical deterioration among children of the unemployed.

These were fair samples of the reports which had emerged in the last twelve months or so. The report of the President of the Royal Society and other scientists, which was made to the Government last year, on malnutrition and kindred subjects ought to be published. It was a year since it was put in, and the House of Commons ought not to be kept in the dark about the state of nutrition of children. A precise inquiry was conducted in Newcastle among the children of those who were out of work and those who were more well-to-do. Among the well-to-do 25 per cent. of the children were above normal height, whereas in the industrial areas 20 per cent. were above and 40 per cent. below. During the nutritional inquiries of the last two or three years in poorer areas evidence had been found of the wide extent of anaemia among children. It arose gradually and imperceptibly, developing as a result of improper or insufficient dietary. In Newcastle 25 per cent. of the industrial classes and those who had been unemployed were below a very low standard. None of the other children were below, and numbers of them were above it. The medical officer of health for Newcastle, Dr. Spencer, experimented on children suffering from malnutrition. He was looking for cases of rickets to treat with a new scientific remedy. In 1921 to 1923 it was difficult in hospital out-patient rooms to find rickets. But in Newcastle, quite recently, forty-four cases had been found quite easily. In the first forty cases which came in the parents were out of work. All this showed that among the children of industrial poor people, particularly if the latter had been out of work and subject to the family means test for a long time, anaemia, rickets, and other developments of a malnutritional kind were prevalent. All sorts of instances throughout the country indicated that about 60 per cent. of the expenditure on food of the poorer people went on cereals, bread, and so on. These did not contain the elements necessary for full health development, and their absence explained dental caries, rickets, and so on to a large extent. These people could not afford eggs, milk, fresh fruit, and vegetables, and filled themselves up with bread and starchy things. The long-continued inability of people in distressed areas to buy the right kind of food was having a damaging effect among the children, and if the regulations to be made on the allowances of the unemployed when produced by the new Assistance Board were accompanied by a proper diet policy, in a few years' time the average stature of British children would be up by a couple of inches, rickets would be wiped out along with 50 per cent. of dental caries and pyorrhoea, and they could practically get rid of child anaemia.

Mrs. Tate remarked that medical knowledge had advanced out of proportion to the availability of that knowledge to the public. That availability would come when they had proper co-ordination of services, proper continuity of services, and above all proper training. In the area served by Guy's Hospital maternal mortality figures had been brought down to 1 per 1,000. That was because in that area a trained staff attended to the people. To-day, however, they had the danger of a less-trained staff. In Guy's Hospital the students and midwives were getting only about half the quantity of the material upon which to learn that was laid down as a minimum by the General Medical Council. They were sending out midwives and doctors who could not know their job properly. It was useless having ante-natal and post-natal clinics unless they were staffed by experts. One main fault lay with the appointment boards of the hospitals, which insisted that before they gave good jobs to nurses they should take a C.M.B. certificate, whether or not they intended to practise midwifery. If the small supply of material was used by nurses who would never practise, the material was taken from nurses who ought to train. The report of the Committee on Fractures, which was issued in February by the British Medical Association, showed that in this country there was a lack of organization in regard to fractures in almost all general hospitals, with a serious loss of money not only to the workman but to the insurance companies. There were two well-organized hospitals for fractures: Ancoats Hospital in Manchester, and the Liverpool Infirmary. In these hospitals in 482 cases of Colles's fracture the disability period averaged seven weeks and the number of cases permanently incapacitated was two. In unorganized hospitals in thirty-eight cases of the same fracture the disability period averaged twenty-nine weeks and the number of cases permanently incapacitated was nine. One of the chief causes of the ill-health of mothers in urban and industrial areas was the tremendous amount of abortion.

Abortion and Maternal Mortality

Lady Astor said she wondered whether the House realized that there had been a fall in the birth rate. That meant that the nation must take particular care of the children who were born. Out of every 100 school children examined 15.9 needed medical attention, 15.4 needed observation, nearly half showed traces of rickets, and more than two-thirds had defective feet. They must increase the number of infant welfare centres and open-air nursery schools for children from 2 to 5 years. The House had talked about maternal mortality for a long time, but had to face the fact that a high proportion of that mortality was due to attempted abortion. Birth control and illegal abortion were going on, and the women of the country were suffering terribly. There was only one ante-natal clinic for every 5,500 persons of child-bearing age, and these clinics were not properly distributed. Such clinics should be under the local authorities, and should be run in conjunction with the child welfare clinics. Ignorance was the chief cause of the practice of abortion. Local authorities had been allowed to give advice since 1934, but of the 1,200 local authorities only sixty had clinics, though it was true that about 150 more referred patients to voluntary agencies, and there were fifty-four voluntary clinics in England and Wales.

Mr. Batey called attention to an inquiry arranged by the Minister of Health to inquire into the substantial and progressive deterioration in public health which Dr. Walker of Sunderland and Darlington, in a letter to the *Times*, had said existed between the Tyne and the Tees. The inquiry was confined to the south, including Sunderland, Seaham Harbour, and Houghton-le-Spring. The worst part of the county of Durham was the south-west, but no inquiry was held there. Unemployment in the south-west was double what it was in the areas selected. He urged a fresh inquiry covering the whole county.

Dr. O'Donovan repudiated the suggestion of Lady Astor that his profession had not done its duty in teaching that abortion was a menace to health. He was taught that when he was a young medical student. He had taught it when he was practising pathology. He had given evidence in public which had been reported in local papers of the fatal danger of abortion to women, and what he had said hundreds of other doctors had said better. Previous speeches had left the impression that birth control was a boon which the poor were denied. He had a familiar working knowledge of the poor, and had never received the impression that either the poor or the rich had, since the War, been unfamiliar with birth-control knowledge. The supply of apparatus was both an expensive and a big business. To suggest that abortion was practically leading to the frequent death of women through

lack of birth-control knowledge was in his opinion a misreading of the facts. There was to-day tremendous propaganda to the effect that marriage need not be associated with child-bearing, and once that idea had bitten into the public mind there was a demand that contraceptive practice should be efficient. The demand of efficiency became almost a passion, and if birth control failed then the woman demanded that that efficiency should be put into practice, and that abortion should complete what birth control failed to do. The one came out of the other, and when through some advocates they added the practice of sterilization they would have the triology of birth control, abortion, and sterilization, which, if imposed upon an unwilling Ministry, would turn it from a Ministry of Health to a Ministry of Death.

Colonel Moore said that the few plastic surgeons were overwhelmed by demands for their skill and service. He asked the Under-Secretary to devote some of the resources of the Ministry to assist in establishing a centre where all the people who were disfigured by nature or accidents could find their way for treatment. Mr. Storey thought the time was coming when a co-ordinated system of hospital treatment for the whole country should be considered. In his own constituency of Sunderland they had two voluntary general hospitals and a municipal general hospital, all rendering general services, but in one of the voluntary hospitals there were fifty vacant beds, while at the same time the local authority proposed to build a new ward block containing eighty beds.

Reply to the Debate

Mr. Shakespeare, replying to the debate, said he wished an occasion would arise when the subjects of birth control and sterilization of the unfit could be more ventilated. The Ministry of Health said it was wrong for a maternity and child welfare centre or a clinic for sick persons paid for out of public funds to give contraceptive advice except in cases where further pregnancy would be injurious to health. The Ministry maintained that position in the circular it issued. Sir Francis Fremantle had asked the position of the new Chief Medical Officer of the Ministry of Health. That official would enjoy the same salary as his predecessor, have the status of a secretary in the same degree, and the same right of direct access to the Minister. There was not a shadow of truth in the suggestion of Dr. Addison that the Government had economized in the care of mothers and children during the last four years. The Government's circular made it plain that, although economy was necessary in 1931, maternity and child welfare centres must be pressed forward. The Committee on Nutrition, for whose report Dr. Addison asked, had reported to the Economic Advisory Committee, which reported to the Cabinet, and the document was therefore confidential. If it was to be published the whole purpose of the committee and the value of the reports would be lost. As a result of the last report the Government had enlarged the Advisory Committee on Nutrition and turned it into a Standing Committee, under the chairmanship of Lord Luke. It now consisted of experts, dietitians, statisticians, medical men, and people with a great knowledge of public health and local conditions. The report on the county of Durham did show that the condition of adolescents from 14 to 16 was far from satisfactory, and the Ministry of Health had taken steps to rectify it, instructing local authorities that they must pay special attention to giving relief to families containing adolescents. While a person was malnourished more food might accentuate digestive disturbances. What was wanted was to ensure that the right food was taken and properly cooked. From experience he knew the mother would always see that the bulk of the resources went to the children. He was more concerned about the health of the mother than about the health of the children. Dr. Simpson in London in 1934 examined the condition of children in some of the poorer areas, and found that equal proportions of malnourished children came from the homes of the unemployed and from homes where means were substantial and the parents were employed. Mr. Shakespeare closed with an assurance that the Ministry would be on its guard constantly, and when it received reports from medical officers of health or any evidence of malnutrition it immediately got into touch with the local authorities. The machinery of public health in this country, both national and local, had so far proved adequate, and through its high efficiency the nation had weathered four years of storm without any real general serious decline in health.

The motion for the reduction of the estimate was negatived, and the debate was adjourned.

Precautions Against Air Raids

In the House of Lords, on July 23rd, Lord Marley discussed the recently issued Home Office circular on precautions against air raids. He said that the gas masks which would be available were of psychological value only. The Government would have to take the question of gas masks much more seriously. They must consider adults, children, and animals. Every mask was quite useless against chlorine gases. The Earl of Feversham said that the Government most strongly deprecated the statement that there was no defence against gas attack and that therefore it was useless to do anything at all. He had been informed by expert advisers that it was feasible to provide protection against gas. In fact, it was often easier to provide this protection than protection against high-explosive bombs. The steps which the Government contemplated would go a great way to minimize the dangers of this form of attack. Stories of gas possessing qualities against which no respirators were a protection were without foundation. The Government was actively engaged in designing a form of respirator which would supply adequate protection against gas for members of the general public. It was an essential requirement that the respirator should be available at a low cost. Such a respirator would provide adequate protection, in addition to such measures as people had been able to take to make some part of their houses gas-proof. In the recruitment of the humanitarian services rescue work, first-aid treatment of casualties, and decontamination the Government would be dependent to a large extent on the British Red Cross Society, the Order of St. John, and St. Andrew's Ambulance Society, which had been good enough to say that so far as practicable they would place themselves at the disposal of both the central and the local governments to supplement official resources. Respirators and protective clothing would be supplied to persons engaged in air-raid services.

Inquiries about air-raid precautions were put, on July 24th, by Mr. Morgan Jones, Mr. Dobbie, and Mr. Neil Maclean. In answer, Mr. Ramsbotham said plans were not contemplated for training school children in gas-mask drill. Captain Euan Wallace said food supplies, in the event of air attack, were being considered as part of the whole problem of air-raid precautions. Evacuation of the populations of London and other large towns was being considered by the Government in connexion with plans for protection of the civil population. Cost of provision on an extensive scale of refuges from explosives and incendiary bombs for the London area and for Glasgow, Manchester, Cardiff, and Birmingham would be prohibitive. During the past twelve months the Home Office had advised on the design and degree of protection of bomb-proof shelters proposed by builders in Middlesex and North London. Specific advice on this subject would be made generally available. The protection of pipes and cables of public utility services from air-raid damage, and their speedy repair were being investigated with the undertakings concerned. The Government knew the importance of protecting the public against the sale of respirators of inferior capabilities. It was giving special consideration to the question of inspection. It was not in the public interest to say whether available supplies of activated charcoal were sufficient to equip gas masks for the whole of the population. Activated charcoal did not deteriorate in storage, and could be kept indefinitely. Particulars of available stocks of bleaching powder could not be stated. Its deterioration was largely a question of packing and storage. Information to local authorities on its use for decontamination purposes would be included in publications now in preparation.

On July 25th Captain Wallace said the Air Raid Precaution Department, in considering the protection of the civil population against poison gas by respirators and otherwise, was paying special attention to the needs of young children. Dr. Addison asked if the Government proposed to leave the invention and advertisement of gas masks to private enterprise. Captain Wallace said this would be done, but under the close

supervision of the Air Raid Precautions Department. Answering Mr. Rhys Davies, Captain WALLACE said any room in a reasonable state of repair could be made gas-proof at a comparatively small cost. It was intended in general to advise the use of suitably protected rooms in private houses and business premises rather than special gas-proof shelters.

Free Milk for Children

Arrangements for the supply of milk to school children next school term have not been completed in the counties of Argyll, Berwick, Roxburgh, Selkirk, Aberdeen, Kincardine, Caithness, Ross and Cromarty, Sutherland, and Nairn. Sir GODFREY COLLINS has communicated with the Milk Marketing Boards with a view to arrangements being made.

Mr. STANLEY stated, on July 25th, that at the end of March, 1935, 51.5 per cent. of the children in public elementary schools in England and Wales were receiving milk at school, the milk being supplied in most cases under the Milk Marketing Board scheme. An inquiry by the London County Council had shown that many children did not join in the scheme because they did not like milk.

Proposed New Poisons Rules

On July 29th Mr. HENDERSON STEWART asked the Home Secretary if he had considered the protest of St. Andrews University against the recent proposals submitted by the Poisons Board, and if he could give an assurance that no attempt would be made, by vesting powers in an outside institution, to infringe the independence of the University in regard to the teaching of chemistry. Captain WALLACE said that the Home Secretary would give the fullest consideration to these representations in conjunction with others he had received. He was not in a position to make any further statement in the matter, since the statutory period for making representations in regard to these rules only expired on July 28th.

Salaries under Scottish Board of Control.—On July 23rd Sir GODFREY COLLINS informed Mr. Guy that the salaries of the medical officers employed in the General Board of Control for Scotland were fixed irrespective of sex, with the qualification that the present woman Deputy Commissioner retained a personal salary until her appointment as Commissioner took effect next October.

Notes in Brief

Steps have been taken by the Ministry of Health to draw the attention of milk traders to the recent report issued by the Department on the Supervision of Milk Pasteurizing Plants.

Dr. Elliot hopes that the report of the Milk Reorganization Commission for Great Britain will be available before the end of the year. The position with regard to milk powder and condensed milk (skimmed and whole) will then receive special consideration from the Government.

Medical News

The annual dinner of the Chelsea Clinical Society will be held at the Rembrandt Hotel, Thurloe Place, S.W., on Tuesday, October 15th, at 7.30 for 8 p.m.

The post-graduate course for former students of the London Hospital Medical College will be held on Wednesday, Thursday, Friday, and Saturday, October 16th to 19th. Further particulars may be obtained from the sub-dean, Dr. A. E. Clark-Kennedy, London Hospital, E.1. The annual dinner for all past students of the hospital will be held at the Trocadero Restaurant, Shaftesbury Avenue, W., on Thursday, October 17th, at 7.30 p.m. Further particulars may be obtained from the honorary secretaries, Mr. E. C. Lindsay, F.R.C.S., and Mr. G. E. Neligan, F.R.C.S., 33, Wimpole Street, W.1.

The twenty-second French Congress of Hygiene will be held at the Institut Pasteur, Paris, from October 21st to 23rd, under the presidency of Professor P. Lereboullet; the subjects for discussion will be the hygiene and protection of infancy. Further information can be obtained from the general secretary, Dr. R. Dujarric de la Rivière, Institut Pasteur, 28, Rue du Docteur Roux, Paris XV.

The thirty-fifth French Congress of Urology will be held in Paris under the presidency of Dr. Thévenot of Lyons on October 7th, when Dr. Beaufond of Paris will read a paper on the influence of pregnancy on the renal excretory apparatus. Further information can be obtained from the general secretary, M. L. Michon, 34, Boulevard des Invalides, Paris 7e.

The International Congress on Malaria, which was to have been held in Madrid next October, has been postponed to the spring of 1936.

Mr. Jacob Epstein has informed the Press that a letter from the Royal Fine Art Commission contains an assurance that the eighteen statues executed by him for the British Medical Association will not be removed from Agar House, Strand. The Commission has been in negotiation with the Southern Rhodesian Government authorities, who now own the building.

The council of Epsom College will shortly elect a girl to a St. Anne's scholarship of £110 a year, tenable at some approved girls' boarding school. Candidates must be not less than 9 years of age on July 30th, 1935, and must be orphan daughters of medical men who for not less than five years have been in independent practice in England or Wales. Application must be made by October 22nd, on a form to be obtained from the secretary of the College, 49, Bedford Square, London, W.C.1.

The Minister of Health and the Secretary of State for Scotland have appointed Dr. T. W. Wade, of the Welsh Board of Health, and Mr. E. M. H Lloyd, Secretary of the Market Supply Committee, to be members of the Advisory Committee on Nutrition, whose composition was given in these columns on June 8th (p. 1187).

The report of the Henry Lester Institute of Medical Research, Shanghai, for 1934 reviews the considerable number of investigations which have been pursued in the fields of clinical medicine and surgery, physiology, pathology, epidemiology and medical statistics, and immunology. A general survey of hospitals has been completed, and the improved system of record-keeping which has been fostered is now resulting in greater knowledge being made available of the prevalence and distribution of various diseases. Special reports are being received also on such conditions as trachoma, kala-azar, malaria, diseases of the nervous and respiratory systems, and various infections. Reports have been published in the *Chinese Medical Journal* as information accrued, and efforts are now being made to investigate effectively various problems in industrial and occupational hygiene and such matters as the prevailing high incidence of forms of non-pulmonary tuberculosis, which cannot in China be ascribed to the consumption of milk. Archaic and very cruel legislation has hitherto hampered the anti-leprosy campaign, but in South China particularly good progress towards more rational treatment is being made. In beriberi it has been shown that vitamin A deficiency plays as important a part as does a lack of vitamin B, while the problem of providing a substitute for cows' milk in the infant dietary seems to be being met satisfactorily by a preparation of soy beans and egg yolk.

The King has approved the appointment of Dr. Barugh Spearman, O.B.E., to be a Member of the Executive Council of the Island of Grenada.

The Duke of Kent has appointed Dr. A. E. Gow to be Physician in Ordinary to His Royal Highness's Household.

On July 25th Mr. G. M. Huggins, F.R.C.S., Prime Minister of Southern Rhodesia, left Croydon by air, on his way home.

The *Liverpool Medico-Chirurgical Journal*, Part II, 1935, contains articles on diverticulosis, functional digestive disorders, acute pancreatitis, and gas-air analgesia as an aid to anaesthesia in children.

The first honorary doctorate of the Chinese University of Shanghai has recently been conferred on Professor B. Nocht of Hamburg.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

The **TELEGRAPHIC ADDRESSES** are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Autology Westcent, London.*
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The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Treatment of Tapeworm

"J. R. F. P." writes: I have a patient, an animal slaughterer, who is possessed of a tapeworm. Treatment by the usual method of aperients, fasting, and filix mas has, after repeated attempts, only succeeded in removing the numerous caudal segments of the worm, while the head remains immovable. Is there any other method one can adopt to eliminate the head?

Frequency of Micturition

"J. A. F." writes: In reply to "N. B. S.'s" inquiry (*Journal*, July 27th, p. 194) regarding a case of frequent micturition in a lady of 70, I suggest that he might try liq. ergotae 15 minims three times a day in a mixture flavoured with aq. chlorof., continued for a week and then given a rest. I have used it, in smaller doses, in many cases of incontinence of urine in young children with very gratifying results.

Car Sickness

"W. R. A." writes in answer to "H. V." (*Journal*, July 27th, p. 193): I have found chloretone (Parke Davis) (5 grains) in capsules invaluable as a prophylactic both in children and in adults. A dose is given one hour before starting, another actually at the start, and, if the journey is long, a further one two or three hours after. In the case mentioned of a child of 3½ half the dose (2½ grains) would be ample.

LETTERS, NOTES, ETC.

Anti-gas Measures

The Air Raid Precautions Department of the Home Office has issued this week a handbook entitled *Anti-gas Precautions and First Aid for Air Raid Casualties* (H.M. Stationery Office, 6d.; post free, 8d.). This opens with a general preface, which refers to the whole series of handbooks now in preparation, and emphasizes that their production is a measure of precaution only and does not arise from any belief that war is imminent. The first of the series has been written primarily for those who would be engaged on first-aid services for the civil population, and especially members of the St. John Ambulance Brigade, the St. Andrews Ambulance Association, and the British Red Cross Society. It includes a description of the gases and other chemical agents which might be employed in war, and indicates the probable methods of their use. Then follow chapters dealing with the general principles for obtaining protection—both personal precautions and the preparation of rooms in which shelter may be obtained. Two types of respirators are described—the general service type as issued to the armed Forces, and the special service respirator, which is a simplified pattern designed mainly for certain classes of persons employed in civil air-raid services. The later chapters describe the organization of the first-aid services, and give the methods of treatment recommended for the various types of gas casualty. They also deal with the decontamination of personnel and clothing, and to a limited extent the decontamination of houses, roads, vehicles, etc. The last chapter describes the organization of a combined first-aid and decontamination centre for members of the public.

Founder's Day at Epsom

An Old Epsomian, whose father was at the College in the early 'sixties, and whose grandfather attended the opening ceremony in 1853, writes: After a lapse of years I was able to go down for Founder's Day at Epsom last Saturday. The weather was delightful, and the College buildings showed to advantage. The new sanatorium—unfortunately closed for the time being—was admired from the outside. The prize-giving in the big schoolroom, and the excellent tea in the grounds to the strains of the East Yorks Band, all went well. But I missed meeting my contemporaries: there seemed to be comparatively few Old Epsomians present. It is, I fear, a habit easy to grow into, that of missing a very pleasant afternoon once a year. Those of us near London, with cars, should always make an effort to attend.

Reunion of War-blinded Masseurs

On July 20th more than fifty blinded ex-service men who had been trained in massage by St. Dunstan's and are now practising as chartered masseurs and biophysical assistants in all parts of the country held their annual reunion at St. Dunstan's in Regent's Park. After luncheon, at which Sir Ian Fraser presided, Dr. Adolphe Abrahams addressed the men on "Fitness and Athletics." Massage, he said, was a curious subject, because the common man looked on it either as a thing capable of doing everything or as a thing capable of doing nothing at all. A great deal had been, and still was, claimed for massage by charlatans which could not be borne out, but what was obvious was that massage could help men to keep fit, and that it could be a great help in the treatment of minor injuries. Above all, there was the psychological value of massage to the athlete. Fitness was not a perquisite of very young men. A man could improve to be a great athlete until the age of 32. As far as ordinary fitness was concerned, a man could go on until the last days of his life taking what some might describe as violent exercise. In relation to the masseurs themselves, Dr. Abrahams went on to comment on the value of their own physical fitness. Psychologically, he said, it was established that a great deal accrued from the association of fit people with their patients. The "atmospheric" influence of being fit vitally affected the people with whom masseurs were so closely in contact.

Fumigation with Hydrocyanic Acid

The London Fumigation Company (Marlow House, Lloyds Avenue, E.C.3) issued, in connexion with the Royal Sanitary Institute's health congress at Bournemouth last month, a small booklet in which all the practical information relating to fumigation with hydrogen cyanide is assembled. The booklet runs to thirty-six pages, and covers the subject well. It is intended for the guidance of public health officials, and should prove invaluable to those about to prosecute a campaign against *Cimex lectularius*.

Transposition of Viscera

Dr. F. A. BEAM (London, W.1) writes: Two patients of mine have transposition of viscera; one is the offspring of first cousins, the other not.

A Warning

A correspondent practising in London asks us to insert a warning about a young girl who has victimized several dermatologists. "She requires treatment for cosmetic blemish, and says that her brother, who is abroad, will settle up on his return. As soon as one specialist refuses to continue without some fee she goes off to another."

Vacancies

Notifications of offices vacant in universities, medical colleges and of vacant resident and other appointments at hospitals will be found at pages 37, 38, 39, 42, 43, and 44 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 40 and 41.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 92.